

From: Obrecht, Alexander K.
To: leng@blm.gov
Subject: BLM HF Stakeholder Conference Call RSVP
Date: Tuesday, March 24, 2015 12:57:08 PM

Hello:

I would like to RSVP for the hydraulic fracturing rule conference call tomorrow. I will be on the line with two of my colleagues (they may have RSVPed already). Could you please confirm that the call in and passcode information are as follows:

Number: (b) (5)

Passcode: (b) (5)

Sincerely,

Alex

My Bio <http://www.bakerlaw.com/FindLawyers.aspx?Lookup_By_Email=aobrecht> | Web site
<<http://www.bakerlaw.com/>> | vCard <<http://www.bakerlaw.com/vcards/aobrecht.vcf>>

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Alexander Obrecht
Associate

aobrecht@bakerlaw.com <<mailto:aobrecht@bakerlaw.com>>

BakerHostetler
1801 California Street
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Denver, CO 80202-2662

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From: Eng, Lissa
Subject: Rescheduling Today's 3 pm Eastern Call RE: Hydraulic Fracturing
Date: Wednesday, March 25, 2015 2:00:18 PM

To: Participants in today's call on Hydraulic Fracturing Rule.

From: Celia Boddington, BLM Assistant Director, Communications

We regret that we need to reschedule today's planned teleconference on the Bureau of Land Management's final rule on hydraulic fracturing on public and Indian lands. We anticipate rescheduling the call as soon as practical. Thank you.

From: Barron, Mark S.
To: vxuan@blm.gov
Subject: BLM HF Workshop RSVP
Date: Monday, June 8, 2015 4:10:45 PM

Good Afternoon Mr. Xuan,

This e-mail serves to RSVP that I will be attending the hydraulic fracturing rule compliance workshop on June 9 at the Grand Junction Field Office. Thank you kindly.

-MB

Mark S. Barron <http://www.bakerlaw.com/FindLawyers.aspx?Lookup_By_Email=mbarron> | BakerHostetler
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From: Xuan, Victor
To: [Barron, Mark S.](#)
Subject: Re: BLM HF Workshop RSVP
Date: Monday, June 8, 2015 4:14:28 PM

Hello Mr. Barron,

Thank you for your e-mail, I have added you to the list for the meeting below:

Grand Junction Field Office,

2815 H Road,

Grand Junction, CO

on June 9th from 1:00-4:00

Thank you!!

On Mon, Jun 8, 2015 at 2:10 PM, Barron, Mark S. <mbarron@bakerlaw.com> wrote:

Good Afternoon Mr. Xuan,

This e-mail serves to RSVP that I will be attending the hydraulic fracturing rule compliance workshop on June 9 at the Grand Junction Field Office. Thank you kindly.

-MB

Mark S. Barron <http://www.bakerlaw.com/FindLawyers.aspx?Lookup_By_Email=mbarron> |
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Victor Xuan | Petroleum Engineer

Bureau of Land Management | Colorado State Office
Office (303) 239-3797 | Fax (303) 239-3799 | vxuan@blm.gov <<mailto:picowan@blm.gov>>

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<<http://www.youtube.com/user/BLMCOLORADO>>

From: Bankert, Roger
To: [johnso4d](#); [lauren](#); [aobrecht](#); [gtodd](#); [rwinterton](#)
Subject: Fwd: powerpoint presentation from frac outreach in Utah
Date: Tuesday, June 23, 2015 11:50:22 AM
Attachments: [Utah Presentation frac operation final.pptx](#)

I typed your emails wrong the first time.

Roger
Roger L. Bankert
Minerals Support Supervisor
Utah State office
801-539-4037

----- Forwarded message -----

From: Bankert, Roger <rbankert@blm.gov>
Date: Tue, Jun 23, 2015 at 9:38 AM
Subject: powerpoint presentation from frac outreach in Utah
To: "abby.bazin" <Abby.Bazin@nblenergy.com>, abusch <abusch@national-fuel.com>, aosbrecht <aosbrecht@bakerlaw.com>, "Baza, John" <johnbaza@utah.gov>, brad <brad@quinexenergy.com>, ccombs <ccombs@crescentpointenergy.com>, "Cesspooch, Ataya" <ataya.cesspooch@bia.gov>, chris <chris@thesummitcompanies.com>, "christina.morris" <christina.morris@qepres.com>, "david.russell" <david.russell@qepres.com>, dgavito <dgavito@crescentpointenergy.com>, "dina.brown" <Dina.Brown@fidelityepco.com>, "doreen.green" <doreen.green@anadarko.com>, ellis <ellis@thesummitcompanies.com>, gtodd <gtodd@duschesne.utah.gov>, hcalder <hcalder@newfield.com>, "Hodges, Kimball E" <khodges@rockiesstandard.com>, "jeff.samuels" <jeff.samuels@anadarko.com>, jkolla <jkolla@crescentpointenergy.com>, johnrogers <johnrogers@utah.gov>, johnson4d <johnson4d@kochind.com>, "julie.jacobson" <Julie.Jacobson@qepres.com>, "julie.olimpio" <Julie.Olimpio@qepres.com>, kelly_kardos <Kelly_Kardos@xtoenergy.com>, "kristina.geno" <Kristina.Geno@anadarko.com>, kspray <kspray@sudoe.us>, "laura.abrams" <laura.abrams@qepres.com>, "lauren.zettler" <Lauren.Zettler@cjes.com>, laurenh <laurenh@utetribe.com>, lcooke <LCooke@badlandsenergy.com>, "lucius.mcgilluray" <lucius.mcgilluray@qepres.com>, manuelm <manuelm@utetribe.com>, "maria.gomez" <maria.gomez@epenergy.com>, mcrozier <mcrozier@newfield.com>, megghan_wilson <megghan_wilson@xtoenergy.com>, mfoster <MFoster@linnenergy.com>, paul <paul@quinexenergy.com>, "Pingree, Antonio" <antonio.pingree@bia.gov>, rjurado <rjurado@pgei.com>, "robert fondren" <Robert.Fondren@epenergy.com>, "roger knight" <Roger.Knight@anadarko.com>, rwinterton <rwinterton@duschesne.utah.gov>, "scott.kalicki" <scott.kalicki@qepres.com>, "shane.schulz" <shane.schulz@qepres.com>, starpoint <starpoint@etv.net>, tadlockd <TadlockD@kochind.com>, "teisha.black" <teisha.black@anadarko.com>, tfallang <tfallang@billbarrettcorp.com>, trevor <trevor@quinexenergy.com>, vanbrax <vanbrax@gmail.com>
Cc: Becky Hammond <bhammond@blm.gov>

Everyone

Attached is the ppt from the frac outreach. We will publish it and the Q/As on the website once the Q/As are finalized. I will send a copy of any other public available guidance as soon as we receive it.

If you would like to have your name removed from this list please let me know.

Thanks

Roger
Roger L. Bankert
Minerals Support Supervisor
Utah State office
801-539-4037

Hydraulic Fracturing (HF) Rule by BLM

Utah BLM Outreach to Industry 2015



U. S. Department of the Interior
Bureau of Land Management – www.blm.gov



Critical Dates

- Effective Date June 24, 2015
- Federal Register published March 27, 2015 with corrections to the phase in dates
 - On page 16218 in paragraph (a)(5) titled “Activities to which this section Applies”, in the Table, make the following corrections:
 - (1) On page 16218, in paragraph (a)(5) titled “Activities to which this section Applies”, in the Table, in the first column, in the fifth row, the entry “(5) Authorized drilling operations were completed after September 22, 2015.” should read “(5) **Authorized drilling operations were completed after December 26, 2014.**” – The operator must comply with all paragraphs of this section.
 - (2) On page 16218, in paragraph (a)(5) titled “Activities to which this section Applies”, in the Table, in the first column, in the sixth row, the entry “(6) Authorized drilling activities were completed before September 22, 2015” should read “(6) **Authorized drilling activities were completed before December 26, 2014.**” – The operator must comply with all paragraphs of this section.

Critical Dates

If...	Then
(1) No APD was submitted as of June 24, 2015.	The operator must comply with all paragraphs of this section
(2) An APD was submitted but not approved as of June 24, 2015.	
(3) An APD or APD extension was approved before June 24, 2015, but the authorized drilling operations did not begin until after June 24, 2015.	To conduct hydraulic fracturing within 90 days after the effective date of this rule, the operator must comply with all paragraphs of this section, except (c) and (d).
(4) Authorized drilling operations began, but were not completed before June 24, 2015.	
(5) Authorized drilling operations were completed after December 26, 2014.	
(6) Authorized drilling activities were completed before December 26, 2014.	The operator must comply with all paragraphs of this section.

Must Comply with All Sections

12/26/14

06/24/15

09/22/15

Drilled and not Fractured
prior to 12/26/14

Any pending APD prior to 6/24/15

All new APDs

Must Comply with All Sections Except c and d

12/26/14

06/24/15

09/22/15

Drilling After 06/24/15

Began drilling before 6/24/15
and completed drilling after 6/24/15

Finished drilling after 12/26/14

How to submit a request for approval of Hydraulic Fracturing 43 CFR 3162.3-3(c)

- Master Hydraulic Fracturing Plan
- With an APD
 - If the information is already included in the APD, it does not need to be repeated.
- Via Sundry Notice
- Note: Hydraulic Fracturing must comply with NEPA

Master Hydraulic Fracturing Plan

- Benefits ??
- Saves time & paper
 - Maps could show multiple proposed wells
 - Information could be listed in table form
- Once approved you would have certainty on how many wells are approved.

Submit plan with APD

- Benefits ??
- Do not have to resubmit information that is already included in the APD
- Ideally if a complete APD and a complete frac plan are submitted together the approval dates should be the same or close.
- NOTE: An incomplete or deficient frac plan does not make the APD deficient or incomplete. But, it can potentially hold up the approval of the APD.

Submit plan with APD cont.

- IM 2013-104 allows BLM to request further “necessary information” to process an APD
- Operators have up to 2 years from receipt of a 30-day letter to submit necessary information.
- Although an APD may be complete, the BLM cannot process the APD without all the necessary information
- If the operator does not submit the necessary information that the BLM requires within the BLM 30-day processing timeline, the BLM must notify the operator in the 30-day letter that the BLM is deferring action on the APD until the operator submits the necessary information. If the operator does not submit the necessary information within 2 years, the BLM will take formal action to deny the APD.

Submit plan via Sundry Notice

- Benefits ??
- Required for previously approved APDs (VFO has over 1300).
- Required for wells that have not completed the authorized drilling operations.
- Required for any subsequent well operation involving HF stimulation (workovers and recompletions).
- (VFO approves between 200 to 300 per year)

How to submit a request for approval of Hydraulic Fracturing Final Comment

- If the BLM determines the frac plan may interfere with other wells, the BLM will require mitigation measures to be submitted prior to approval.
- Potential mitigation measures could include:
 - Well or equipment repairs on offsetting wells
 - Would require standard NOI and SR Sundry Notices to be approved prior to approval of the frac plan
- Operator would be responsible to work with offset well operator(s) to take appropriate mitigation measures

Monitoring and verification of cementing operations prior to hydraulic fracturing

43 CFR 3162.3-3(e)(1)(i)

- This paragraph only applies to casing used to isolate and protect usable water zones
- Isolate and protect usable water zones is not a new requirement.
- 43 CFR 3162.3-3(e)(1)(i) only requires better documentation that must be submitted at least 48 hrs prior to frac operations
- Must submit at least 48 hrs in advance; but, no approval is required prior to starting frac operations.

Monitoring and verification of cementing operations prior to hydraulic fracturing

43 CFR 3162.3-3(e)(2)

- This paragraph only applies to casing used to isolate and protect usable water zones.
- Remediating inadequate cement jobs and documenting for all casing strings is not a new requirement.
- 43 CFR 3162.3-3(e)(2) only requires better documentation and it must be submitted at least 72 hours prior to starting frac operations.
- Must submit at least 72 hrs in advance; but, no approval is required prior to starting frac operations.

Monitoring and verification of casing integrity prior to hydraulic fracturing

43 CFR 3162.3-3(f)

- Not a new requirement
- Required in Onshore Order #2
- State of Utah rule R649-3-23 requires it.
- Both rules require casing to be tested to 70% internal yield pressure. If you anticipate that casing pressure during a frac will exceed 70% then test the casing to the anticipated pressure the first time.
- Results submitted in the subsequent report after the frac (item 9 on the list).

Monitoring of annulus pressures during hydraulic fracturing operations

43 CFR 3162.3-3(g)

- A common practice
- Shutting down a frac operation if the pressure exceeds 500 psi and notifying the BLM is a new requirement.
- Example - If the frac operation is designed with a pressure of 1,000 psi to be held on the backside, and if it exceeds 1,500 you would need to shut down.

(Common sense says if you cannot hold the pressure on the backside then you need to shut down)

Water Disposal Requirements

43 CFR 3162.3-3(h)

Except as provided in paragraphs (h)(1) and (2) of this section, all fluids recovered between the commencement of hydraulic fracturing operations and the authorized officer's approval of a produced water disposal plan under BLM requirements must be stored in rigid enclosed, covered, or netted and screened above-ground tanks. ...The tanks must not exceed a 500 barrel capacity unless approved in advance by the authorized officer.

Authorized officer may approve an application to use lined pits having certain design requirements.

Water Disposal Requirements continued

- The term “all fluids recovered” does not differentiate between flowback fluids and produced water.
- Requirements are effective until a disposal of produced water is approved pursuant to Onshore Order #7
- No 90 day grace period

Information that must be provided after hydraulic fracturing is completed.

43 CFR 3162.3-3(i)(1)

The information required in paragraph (i)(1) of this section must be submitted to the authorized officer through FracFocus or another BLM designated database, or in a Subsequent Report Sundry Notice (Form 3160-5).

Note: A completed Form 3160-4 (Completion-Recompletion report) must still be submitted.

Information that must be provided after hydraulic fracturing is completed.

43 CFR 3162.3-3(i)(1) continued

- 43 CFR 3162.3-3(i)(1) – Includes
 - The true vertical depth of the well,
 - Total water volume used,
 - A description of the base fluid,
 - Each additive in the hydraulic fracturing fluid, including the trade name, supplier, purpose, ingredients, Chemical Abstract Service Number (CAS),
 - Maximum ingredient concentration in additive (percent by mass),
 - And maximum ingredient concentration in hydraulic fracturing fluid (percent by mass).

Information that must be provided
after hydraulic fracturing is completed.
43 CFR 3162.3-3(i)(2) through (i)(10)

The information required in paragraph (i)(2) through (i)(10) of this section must be submitted to the authorized officer in a Subsequent Report Sundry Notice (Form 3160-5).

Note: A completed Form 3160-4 (Completion-Recompletion report) must still be submitted.

Identifying Information claimed to be exempt from public disclosure

43 CFR 3162.3-3(j)

- No specific definition of “corporate officer”
- If the BLM decides it is not exempt from disclosure, the BLM will give the company 10 business days notice prior to releasing the information to the public.
- Subsequent operators are responsible for this information.

Operator (Individual) Requested Variances

43 CFR 3162.3-3(k)(1)

- Variance is submitted to the Authorized Officer (Field Office Manager)
- Authorized Officer can:
 - Approve
 - Approve with Conditions of Approval
 - Deny
- The decision on a variance request is not subject to administrative appeals either to the State Director or under 43 CFR part 4.

State or Tribal Requested Variances

43 CFR 3162.3-3(k)(2)

- Variance is submitted to the Authorized Officer (State Director)
- Includes a variance that would apply to all wells within a State
- Authorized Officer can:
 - Approve
 - Approve with Conditions of Approval
 - Deny
- The decision on a variance request is not subject to administrative appeals either to the State Director or under 43 CFR part 4.

State or Tribal Requested Variances 43 CFR 3162.3-3(k)(2) continued

State or tribal variance: In cooperation with a State (for Federal lands) or a tribe (for Indian lands), the appropriate BLM State Director may issue a variance that would apply to all wells within a State or within Indian lands, **or to specific fields or basins within the State or the Indian lands**, if the BLM finds that the variance meets the criteria in paragraph (k)(3) of this section (must meet or exceed the objectives of the regulation)



Thank You for Your Attendance

Salt Lake City, Utah

June 16, 2015

From: Moses-Nedd, Cynthia
To: [Cynthia Moses-Nedd](#)
Subject: BLM Marks Major Gains in 2015 Ensuring Safe and Responsible Energy Development on Public Lands
Date: Monday, December 28, 2015 1:41:11 PM
Attachments: [BLM News Release 2015 Energy Accomplishments 12 28 2015.docx](#)

Hello & Happy Holidays,
Attached and below please find the press release highlighting progress made by BLM in 2015 promoting responsible energy development on public lands while also managing for multiple use on the 245 million acres it manages.

We value the partnership we have been able to build with you through the years and look forward to continuing to work together in the coming year.

Feel free to contact our office if needed.

Cynthia

Cynthia Moses-Nedd
Division Chief (Acting) External Affairs
Liaison to State & Local Government
DOI-BLM Office of Communications
Washington, DC
(202) 912-7446 Ofc
(202) 821-9410 Cell

Bureau of Land Management

Contact: Bev Winston, 202-912-7239

For immediate release

Date: December 28, 2015

**BLM Marks Major Gains in 2015 Ensuring Safe and Responsible
Energy Development on Public Lands**

Modernized Regulations and Moved Ahead on Renewable, Conventional Development

WASHINGTON – The Bureau of Land Management (BLM) made major progress in 2015 promoting responsible energy development on public lands while also managing for a wide range of uses on the agency’s 245 million acres. While BLM advanced modern safety and production-measurement regulations, the agency also made progress on the development of master leasing plans for oil and gas areas as well as new landscape-scale planning efforts to achieve both conservation and energy development goals.

“Each accomplishment is significant on its own, but together, they’re a big stride forward in our management of the nation’s energy resources,” said BLM Director Neil Kornze.

Promoting Responsible Energy Development

The BLM is a national leader in forging a path toward more production of clean, American-made [renewable energy](#). In 2015, the BLM approved five solar energy projects that will bring an additional 977 megawatts of power online once they are built that have the potential to create approximately 5,600 jobs. These approvals put the BLM 75 percent of the way to the President’s Climate Action Plan goal of approving projects that will generate 20,000 megawatts of renewable energy by 2020.

In addition, the BLM approved six transmission projects to help unlock wind and solar resources that cannot be currently accessed due to lack of infrastructure to bring the energy produced from these sources to the grid. Among those are SunZia transmission project in Arizona and New Mexico, that, when built, will have the potential to add up to 3,000 megawatts of electrical capacity in the Southwest.

Last month, the BLM partnered with the State of California and several other Federal and State agencies to finalize the first phase of the [Desert Renewable Energy Conservation Plan](#), which heralds a new generation of landscape-scale land use planning to achieve both conservation and energy development goals. The plan will allow for timely permitting of solar projects in appropriate areas of the California desert.

Conventional Energy Plays Important Role

Over the past year, the BLM held 22 oil and gas lease sales, generating more than \$159 million in bonus bids and rental fees in addition to royalties. Approximately half of this revenue went directly to the states in which the development is located, supporting local economies all across the country. The [BLM's coal program](#), meanwhile, took in about \$1.29 billion in royalties, rents, and bonuses in 2015. Earlier this year, Secretary Jewell called for [a public dialogue](#) about how best to operate the Federal coal program and whether the American taxpayer is receiving a fair return for the mining of public resources. The BLM is reviewing the extensive comments received during five public meetings as it considers how best to move forward.

Modernizing Energy Regulations to Keep Pace with 21st-Century Practices

Years of work at the BLM to modernize its out-of-date oil and gas regulations began to take shape this year in the form of proposed and final regulations. Many of the oil and gas regulations at the BLM have never been updated since they were adopted in the 1980s, soon after onshore leasing became the BLM's responsibility.

In March, the BLM published its [final rule](#) on hydraulic fracturing, an oil and gas extraction technique that has opened up millions of acres to potential development. The rule protects water quality for communities by addressing the soundness of well construction and the handling of water after it is used in the well. It also increases the public's access to information about chemicals used and other aspects of the hydraulic fracturing process. Implementation of the rule is on hold, pending litigation.

This summer and fall, the BLM also published [three proposed rules](#) that deal with oil and gas development. These regulations establish the proper procedures for how producers should measure and account for the energy resources they extract from national public lands. Public comments on the proposed rules will be taken into account as the final rules are written in 2016.

Permits and Master Leasing

In October, the [BLM approved](#) a drilling permit and a right-of-way grant for the Greater Mooses Tooth One project that will open the way for the first production of oil and gas from federal land in the National Petroleum Reserve in northern Alaska. The permit implements a series of best management practices, lease stipulations, and mitigation measures to prepare for the potential impacts from the project, including establishment of a compensatory mitigation fund. The funds will go toward a landscape-level regional mitigation strategy, currently under development through a collaborative, multi-stakeholder process that includes representatives from across Alaska.

The past year also marks considerable progress for oil and gas leasing reform with the completion of six master leasing plans (MLPs) in Wyoming and Colorado, and the publication of a draft MLP for Moab, the first plan in Utah to reach that stage. MLPs are designed to guide mineral development in a defined area for the foreseeable future by identifying potential resource conflicts early in the planning process.

By providing for more orderly development, MLPs will lend more certainty to industry while limiting the number of protests, which had drastically slowed leasing. As part of the BLM's broader program of leasing reform, these plans and related initiatives such as more thorough review of lease parcels before a sale have greatly reduced the number of parcels protested. The number of protests has declined dramatically, from 1,475 protested parcels from original lease sale notices in 2009 to 321 in 2014.

The BLM manages more than 245 million acres of public land, the most of any Federal agency. This land, known as the National System of Public Lands, is primarily located in 12 Western states, including Alaska. The BLM also administers 700 million acres of sub-surface mineral estate throughout the nation. The BLM's mission is to manage and conserve the public lands for the use and enjoyment of present and future generations under our mandate of multiple-use and sustained yield. In Fiscal Year 2014, the BLM generated \$5.2 billion in receipts from public lands.

--BLM--



BLM NEWS RELEASE

U.S. Department of the Interior • Bureau of Land Management • Washington, D.C., Office • 1849 C Street N.W. • Washington, D.C.

Bureau of Land Management
For immediate release

Contact: Bev Winston, 202-912-7239
Date: December 28, 2015

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This summer and fall, the BLM also published [three proposed rules](#) that deal with oil and gas development. These regulations establish the proper procedures for how producers should measure and account for the energy resources they extract from national public lands. Public comments on the proposed rules will be taken into account as the final rules are written in 2016.

Permits and Master Leasing

In October, the [BLM approved](#) a drilling permit and a right-of-way grant for the Greater Mooses Tooth One project that will open the way for the first production of oil and gas from federal land in the National Petroleum Reserve in northern Alaska. The permit implements a series of best management practices, lease stipulations, and mitigation measures to prepare for the potential impacts from the project, including establishment of a compensatory mitigation fund. The funds will go toward a landscape-level regional mitigation strategy, currently under development through a collaborative, multi-stakeholder process that includes representatives from across Alaska.

The past year also marks considerable progress for oil and gas leasing reform with the completion of six master leasing plans (MLPs) in Wyoming and Colorado, and the publication of a draft MLP for Moab, the first plan in Utah to reach that stage. MLPs are designed to guide mineral development in a defined area for the foreseeable future by identifying potential resource conflicts early in the planning process.

By providing for more orderly development, MLPs will lend more certainty to industry while limiting the number of protests, which had drastically slowed leasing. As part of

the BLM's broader program of leasing reform, these plans and related initiatives such as more thorough review of lease parcels before a sale have greatly reduced the number of parcels protested. The number of protests has declined dramatically, from 1,475 protested parcels from original lease sale notices in 2009 to 321 in 2014.

The BLM manages more than 245 million acres of public land, the most of any Federal agency. This land, known as the National System of Public Lands, is primarily located in 12 Western states, including Alaska. The BLM also administers 700 million acres of sub-surface mineral estate throughout the nation. The BLM's mission is to manage and conserve the public lands for the use and enjoyment of present and future generations under our mandate of multiple-use and sustained yield. In Fiscal Year 2014, the BLM generated \$5.2 billion in receipts from public lands.

--BLM--

From: Gamper, Merry
To: [Cowan, Gregory](#)
Subject: Re: [Today] Last Call: Administrative Remedies Forum
Date: Thursday, February 4, 2016 5:42:49 PM
Attachments: [Participation in the Federal Oil and Gas Program_MGAMPER.BLM_WSO.02042016.ppsx](#)

Good afternoon. Thanks for the call today.

Here is my powerpoint. Please let me know if you have any questions.

Best,

-Merry

Merry E. Gamper
Fluid Minerals Program Lead (WY921)
Wyoming State Office
5353 Yellowstone
Cheyenne, WY 82001
307.775.6272
mgamper@blm.gov

On Thu, Feb 4, 2016 at 11:01 AM, Cowan, Gregory <gcowan@wyo-wcca.org> wrote:

Good morning.

Here is the dial-in information for this afternoon 2:00 pm call:

(b) (5)

code: (b) (5)

We'll have a logistics update and get any final thoughts/questions from those calling in.

Gregory

From: Cowan, Gregory
Sent: Friday, January 29, 2016 2:59 PM
To: 'mgamper@blm.gov'; Murdock, Pamela; Lowe, Philip (philip.lowe@sol.doi.gov); kktu@fs.fed.us; Loomis, David E; njmiller@fs.fed.us; krutledge@fs.fed.us; Henning, Sandy J -FS (shenning@fs.fed.us); Jessica Crowder; marty_griffith@blm.gov; mgoertel@blm.gov; McClure, Tom -FS (tmccclure@fs.fed.us); Joel Bousman

(Joel.Bousman@sublettewyo.com); Ryan Lance (RLance@crowell.com); 'Richard Ladwig (nfsupply59@gmail.com)'; Rob Mathes (robert.mathes@dgsllaw.com); Obermueller, Pete; Chris Wichmann (chris.wichmann@wyo.gov); Jim Magagna; esther@pawyo.org
Subject: Remedies Forum Program and Updated Registration Link

Good afternoon.

Here is the updated registration link <<http://wcca.site-ym.com/events/EventDetails.aspx?id=750335>> for the forum that includes a downloadable program for the afternoon's discussion. Thank you all for the bios. Hearing from our agency friends regarding security concerns, I left their photos off the program.

Spread the word; registration is currently at 53. I've also requested 3 hours of CLE credits.

Have a great weekend and I look forward to connecting next Thursday afternoon.

All the best,

Gregory

Gregory M. Cowan

Natural Resource Staff Attorney

Wyoming County Commissioners Association <<http://www.wyo-wcca.org/>>

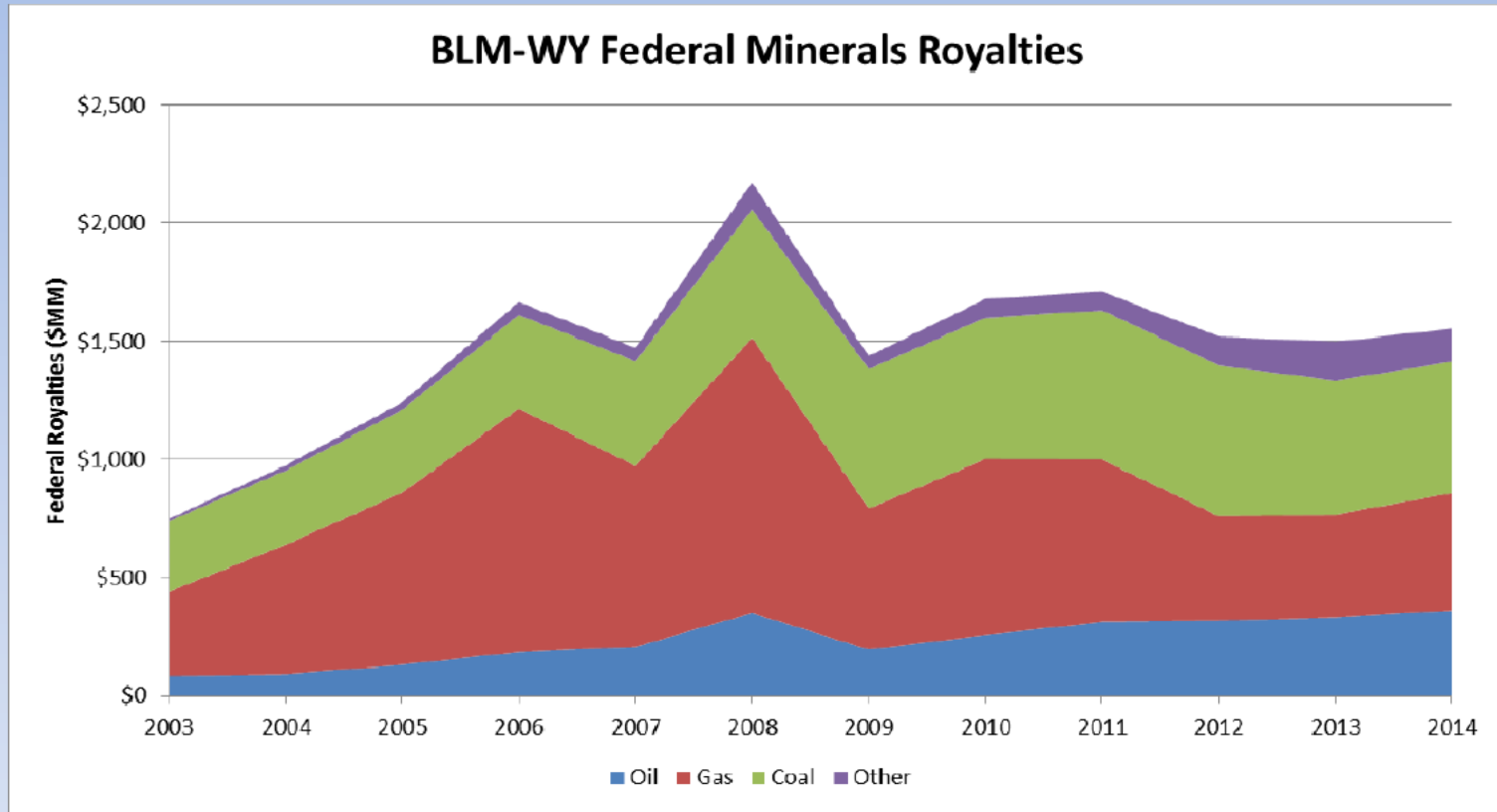
O: 307.632.5409

C: 307.275.4746

F: 307.632.6533

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PARTICIPATION IN THE FEDERAL OIL AND GAS PROGRAM



Merry E. Gamper
 BLM-Wyoming State Office
 Fluid Mineral Program Lead
 February 10, 2016



OVERVIEW

Provide information about when and how participation in the administration of the Federal Oil and Gas Program can occur. For operations on other Surface Management Agency (SMA) lands, BLM cannot take action without the consent of the SMA. Technical and NEPA reviews are limited to downhole operations.



THE PUBLIC

- Vested interest in the management of public lands.
- Has an interest in protecting and/or promoting a wide array of often competing uses for public lands.

PRIVATE SURFACE OWNERS

- The surface owner has rights accorded them by law and under the patent reserving mineral estate to the United States.
- Participation in onsite, accommodation of reasonable requests.
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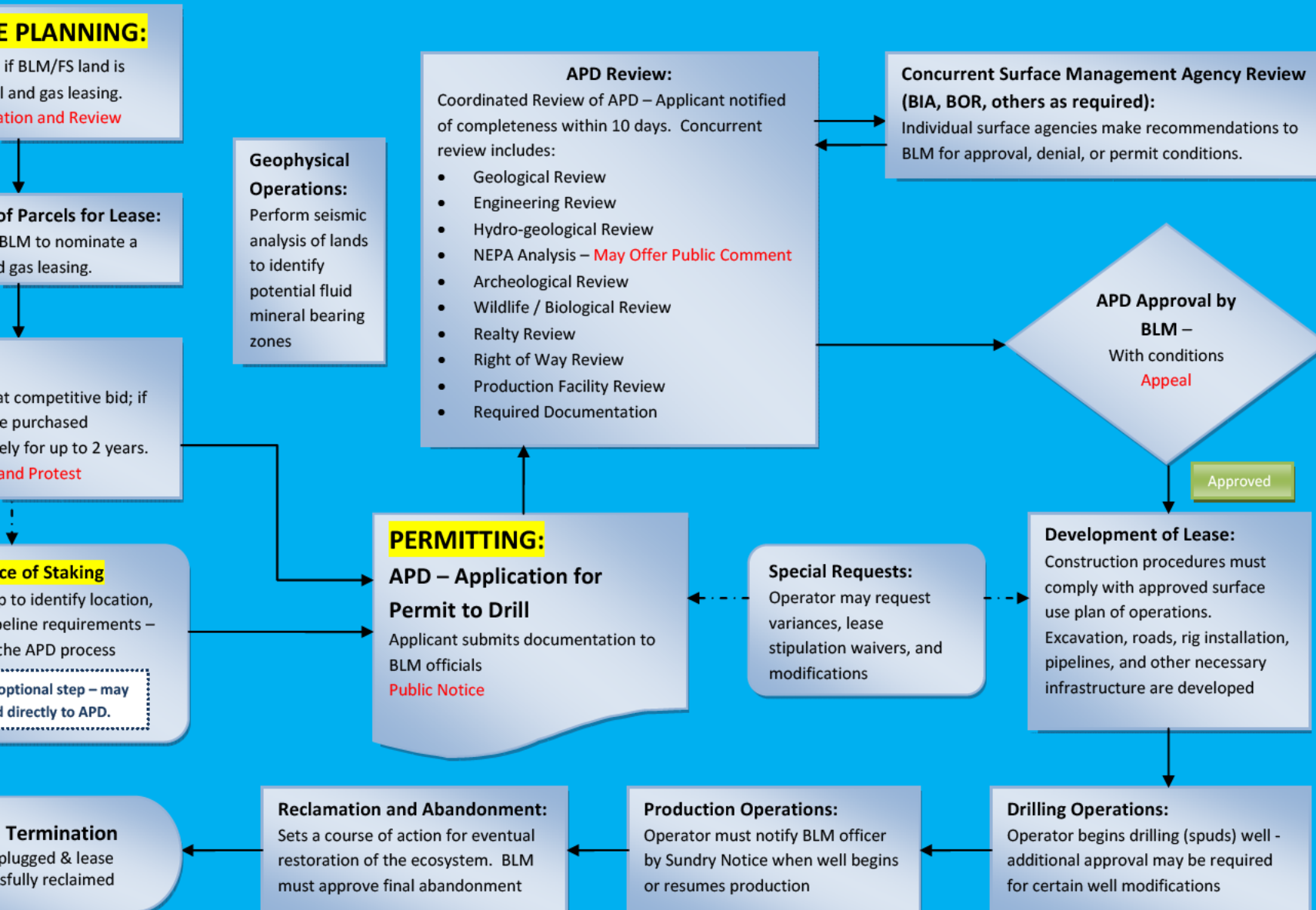


STATUTORY AUTHORITIES

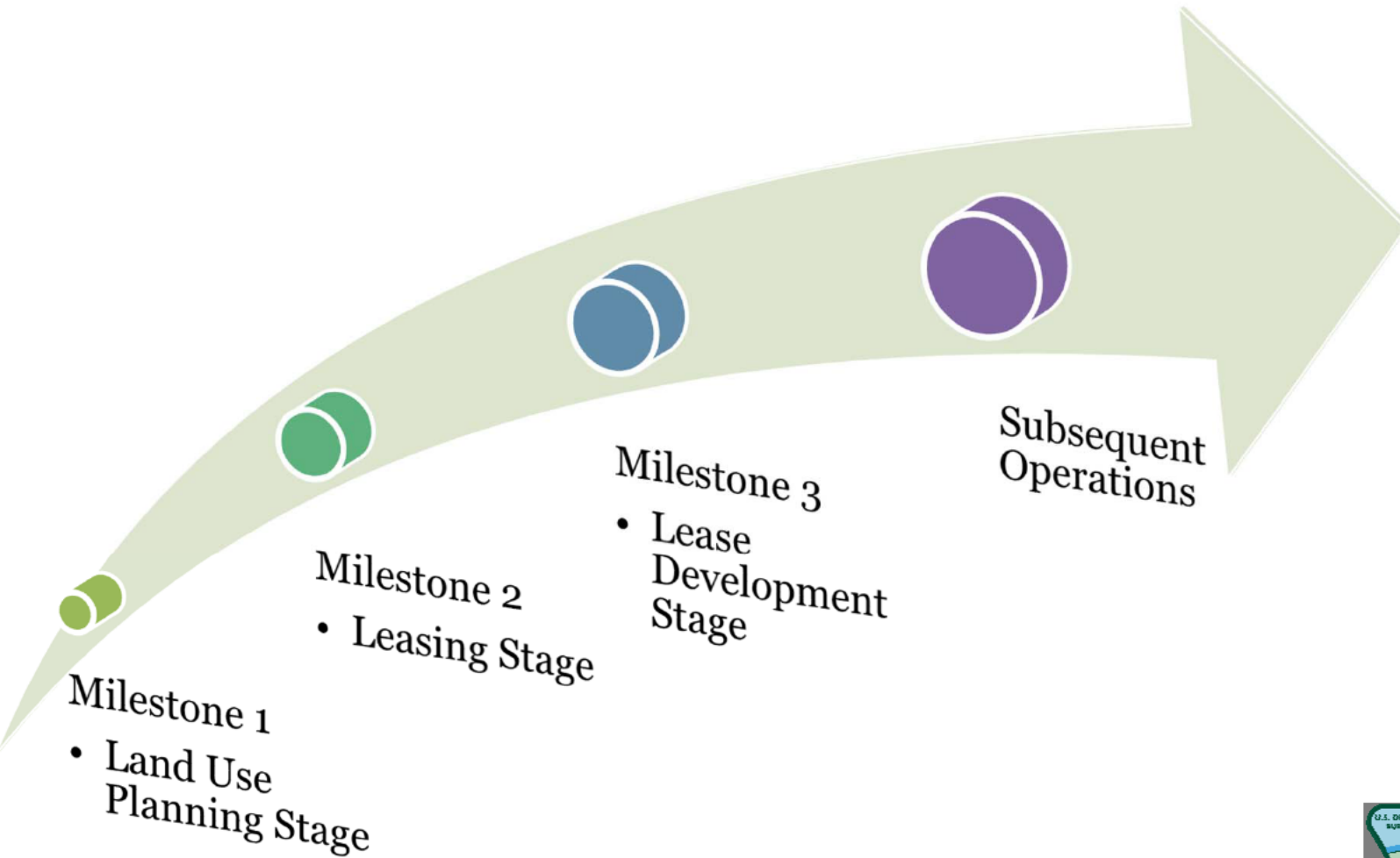
- Mineral Leasing Act (30 U.S.C. 181 *et seq.*)
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- Others
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OIL AND GAS DEVELOPMENT PROCESS



ARTICIPATION TIMELINE



ISSUES AND RESOLUTION

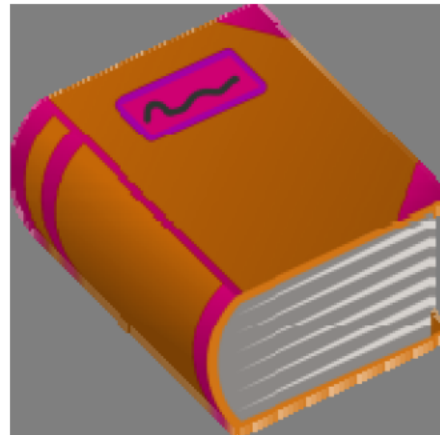
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 - Hard look standard
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- Regulatory Authority
 - Arbitrary and Capricious
 - Violation of Valid Existing Lease Rights
- Procedures/Process



LAND USE PLANNING

Planning for Fluid Minerals Handbook

- Reasonably Foreseeable Development Scenario
- Allocations
 - Open or Unavailable
 - Constraints
 - » Minor
 - » Moderate
 - » Major



REASONABLY FORESEEABLE DEVELOPMENT POTENTIAL

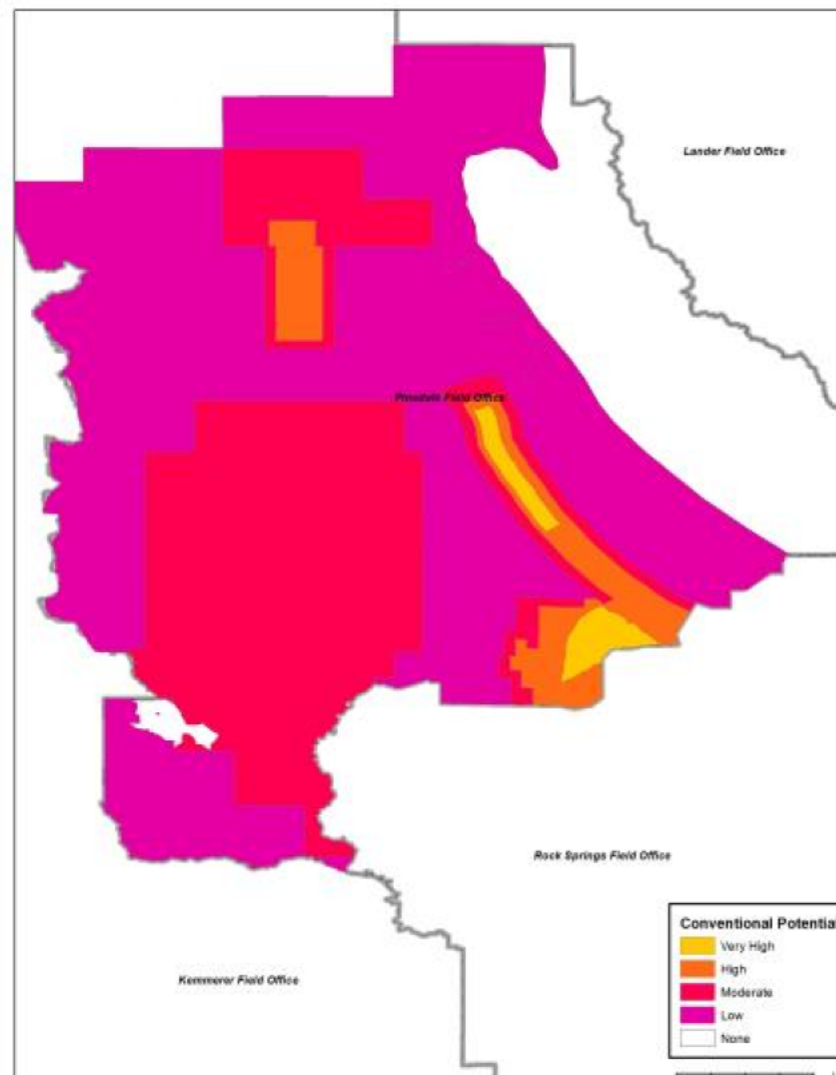
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Development Potential
Report.

Baseline and Alternative by
Alternative Comparison.

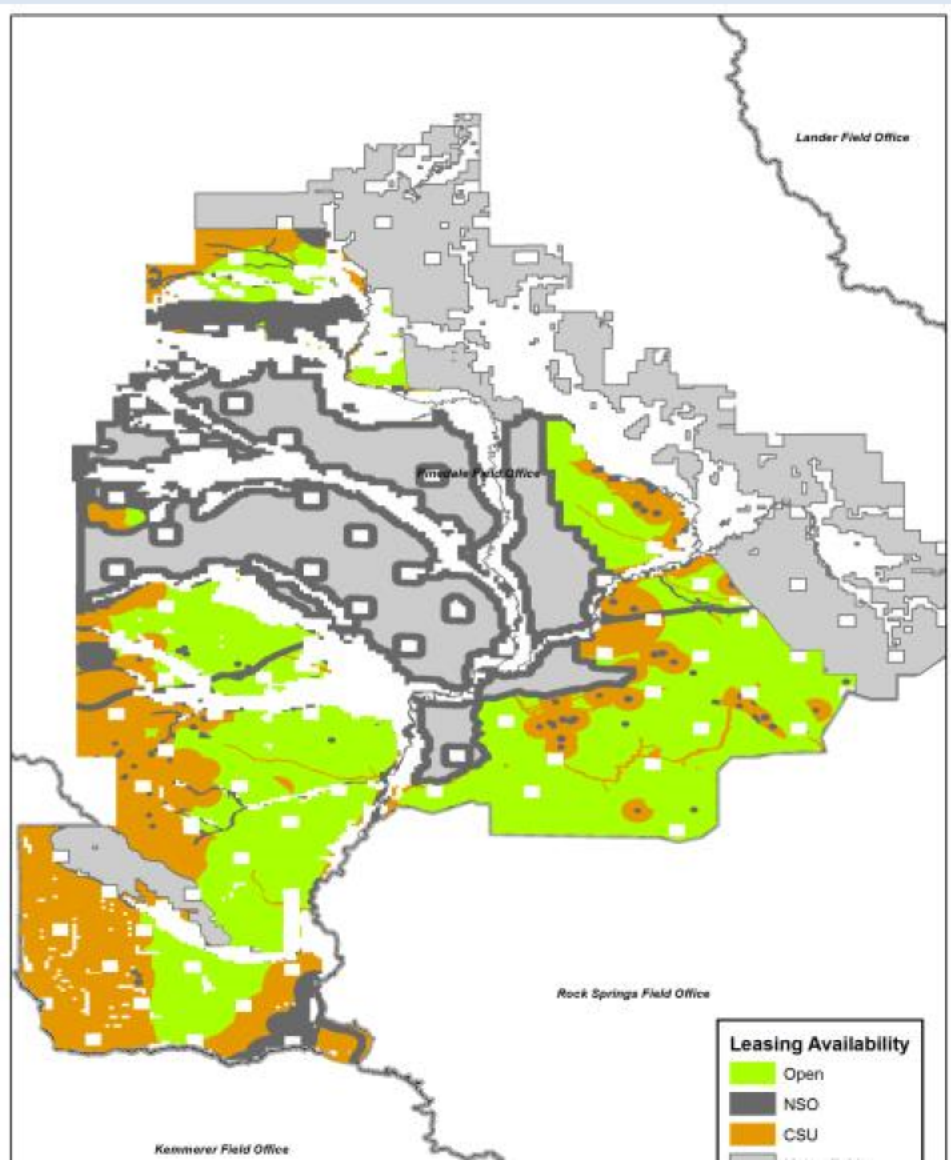
Used to project expected
impacts from allocation

decisions and subsequent

development.



LANDUSE PLAN AVAILABILITY



BLM - Wyoming



COMPETITIVE LEASING

BLM - Wyoming



FEDERAL ONSHORE OIL & GAS LEASING PROCESS MODEL

Minerals Leasing Act of 1920 and the 1987 Federal Onshore Oil and Gas Leasing Reform Act

BLM State Office: Conducts Lease Sales (at Least Quarterly)

(Regulations that govern the BLM's oil and gas leasing program may be found in Title 43, Groups 3000.5-3100)

ENERGY POLICY ACT 2005

Included in bid for competitive lease

Parcels identified by informal expressions of interest (EOI) by Industry.

Parcels identified by informal expressions of interest (EOI) by the public.

Existing oil & gas leases just expired, terminated, relinquished, cancelled, including 12 month old parcels received in over-the-counter applications.

Parcels identified by the BLM for land & resource management reasons.
Example: Protective leasing.

Field Office: Checks/Evaluates Parcels
for availability, other agency consent, potential resource conflicts and environmental issues.
Develops and makes recommendations for special stipulations and/or withdrawal from proposed offering.

Land Use Planning System

State Office: Consolidates List of Parcels.
Final Sale Notice posted at least 90 days prior to sale.

Land Use Plans (LUPs)
Analyze land uses and resources to determine what lands should be open to oil and gas leasing.

Additional Site-Specific Analysis
Occurs prior to exploration, ground disturbing activities, or development activity.

State Office: Competitive Sale -- Oral Auction

No Bid

Successful Bid

Lease Sale Environmental Reviews
Occur prior to lease sales to ensure consistency with LUPs and NEPA adequacy. Review may result in parcels being deferred for further analysis or environmental stipulations being placed on the lease

Leased

Lease available over-the-counter for 24 months

Filing Received

Issue **Noncompetitive Lease** (10 year primary term)

Lessee/Operator
Exploration Development
Production Abandonment Reclamation

Fluid Minerals Program
Plans of development
Bonding- \$ 50,000.00/Lease
Assignments & Adjudication
Diligence
Production Verification
Collections
Unitization/Communication
Drainage
Plugging and abandonment
NEPA: EIS, EA, CA
Geophysical Permits
Rights-of-way
Gas storage
Development Contracts

Issue **Competitive Lease** (10 year primary term)

Lessee/Operator
Exploration
Development
Production
Abandonment
Reclamation

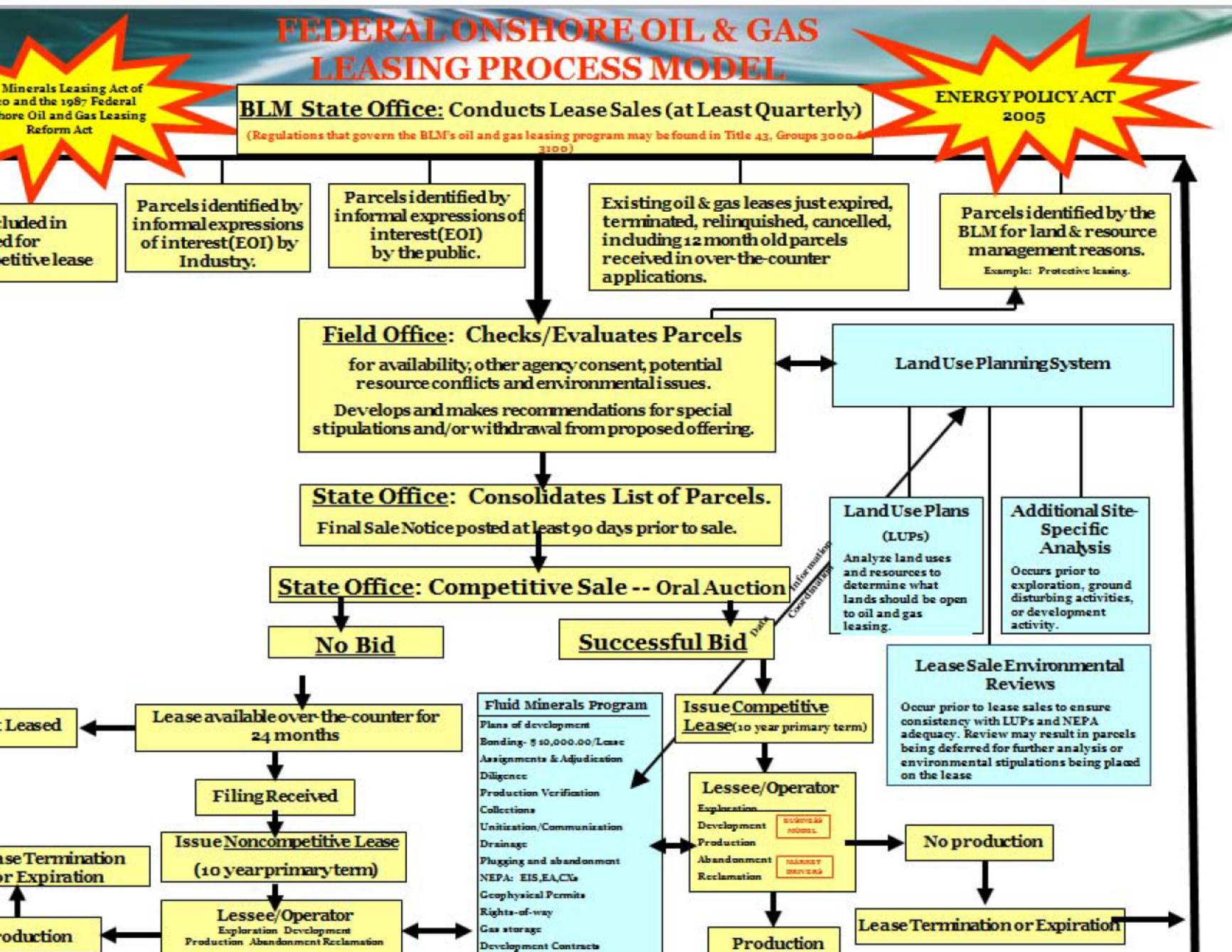
Production

No production

Lease Termination or Expiration

Lease Termination or Expiration

Production



LEASE SALES

Mandated to Conduct Lease Sales (at least) Quarterly

BLM conducts an Internal interdisciplinary review

BLM determines if:

- There is significant new information
- The proposal is in conformance with the plan
- Parcels are Available for offering

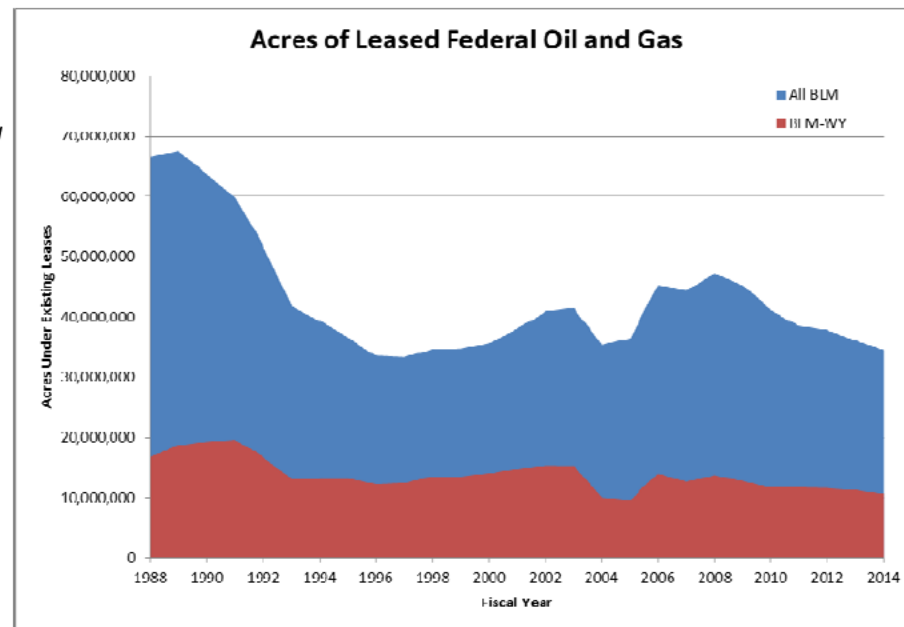
BLM provides for surface inspection of lease parcels

State agency coordination



LEASE PARCEL NOMINATIONS AND SALE

Washington Office
Construction Memorandum
010-117: *Oil and Gas Leasing
reform – Land Use Planning
and Lease Parcel Reviews*
Landowner and SMA
Notification Letters
30-day formal Public Comment
Period



Test Period (43 C.F.R. §4.450-
and 43 C.F.R. § 3120)

Superior Board of Land Appeals

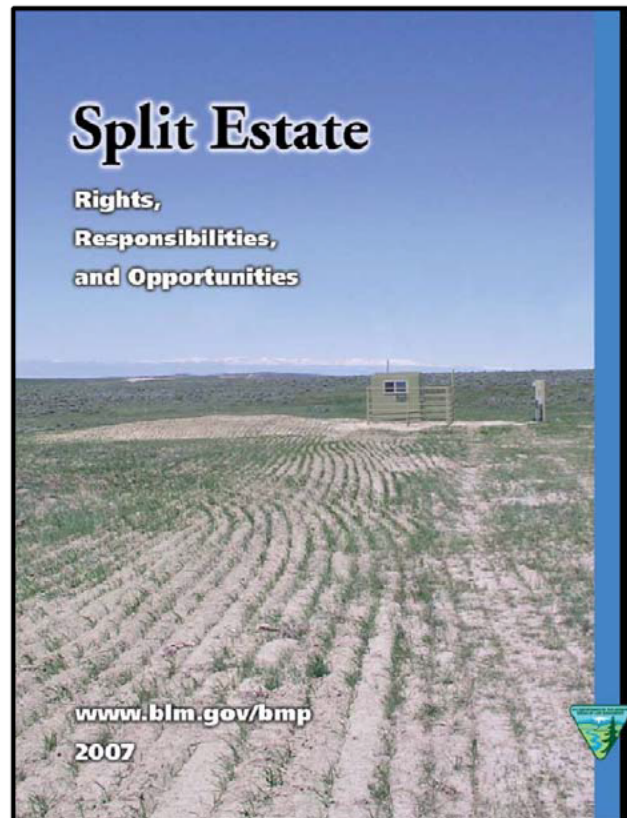


LEASING ISSUES

Split Estate Leasing

Energy Policy Act of 2005 and 2006
Split Estate Report to Congress:
The BLM will now provide courtesy
notification to surface owners when
split estate lands are included in a
lease sale

▶ Parties submitting an Expression of
Interest (EOI) are now required to
provide BLM with the name and address
of any surface owners where split estate
lands are included in their EOI.



EASE SALE PROTESTS AND APPEALS

30 day protest period

Protests must be timely

Sale Book must be posted 45/90 days prior to sale

Protests must state the interest of the party filing

Protests may not be emailed but can filed hardcopy and/or faxed.

- o Petitioners if faxing a protest, should call to ensure it was received.

Similar to land use plan protests, participation in the decision making process is generally required when a protestor is challenging on NEPA grounds.



LEASE STIPULATION WAIVERS OR MODIFICATIONS

43 C.F.R. § 3101.1-4

- o If the authorized officer has determined, prior to lease issuance, that a stipulation involves an issue of major concern to the public, modification or waiver of the stipulation shall be subject to public review for at least a 30-day period. In such cases, the stipulation shall indicate that public review is required before modification or waiver.
- o If subsequent to lease issuance the authorized officer determines that a modification or waiver of a lease term or stipulation is substantial, the modification or waiver shall be subject to public review for at least a 30-day public period.



LEASE REINSTATEMENTS

Washington Office Instruction Memorandum 2013-177:
*NEPA Compliance for Oil and Gas Lease Reinstatement
Petitions*

Before approving or denying an oil and gas lease
reinstatement petition, all Bureau of Land Management
(BLM) offices must review applicable RMPs and NEPA
documentation to:

- Ensure reinstatement of the lease would be in conformance with the existing RMP, including consent of SMA as necessary.
- Evaluate the adequacy of existing NEPA analysis and documentation related to the lease parcel; and
- Complete any necessary new or supplemental NEPA analysis and documentation.
- Intent to reinstate has to be published in the Federal Register

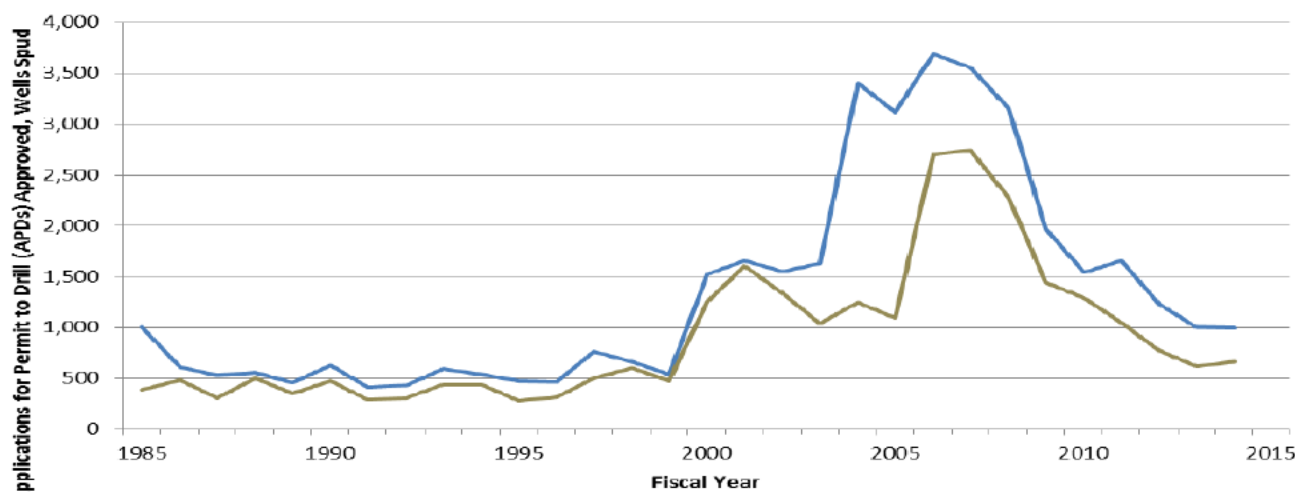


EASE OPERATIONS

Application for Permit to Drill

- “The operator shall submit to the authorized officer for approval an Application for Permit to Drill for each well. No drilling operations, nor surface disturbance preliminary thereto, may be commenced prior to the authorized officer’s approval of the permit.” (43 C.F.R. §3162.3-1(c))

**Number of APDs Approved, Federal Wells Spud:
BLM-Wyoming**



WELL AUTHORIZATIONS

43 C.F.R. §3162.3-1(g):

- “For Federal lands, upon receipt of the [APD] or [NOS], the authorized officer shall post the following information for public inspection at least 30 days before the action to approve the [APD]...”

see also: Onshore Order No. 1 (III)(E)(1)

Internet postings, in some states/offices

FOIA



REQUEST FOR STATE DIRECTOR REVIEW

43 C.F.R. § 3165.3(b) and Washington Office Instruction Memorandum 2011-141: *Procedures for Responding to Requests for State Director Review following Certain Oil and Gas Operation Decisions.*

- SDR can be requested by any adversely affected party from any instruction, order or decision issued under the regulations in 43 C.F.R. § 3160, Onshore O&G Operations, or 43 C.F.R. § 3180, Onshore O&G Unit Agreements-Unproven Areas.
- Must be filed with the State Directors Office with all supporting documentation within 20 business day. May request additional time to provide supporting materials for good cause.
- Petitioner may request an Oral Presentation and the AOs decision remains in effect until stayed, modified or overturned.



STATE DIRECTOR REVIEW cont.

Petitioners can request a Stay of the decision pending resolution of the SDR.

Decision on Stay will be based upon the potential for permanent harm if the decision remains in full force and effect.

In order to determine the potential for permanent harm, BLM considers the same criteria used by the Interior Board of Land Appeals. Petitioner must meet at least one.

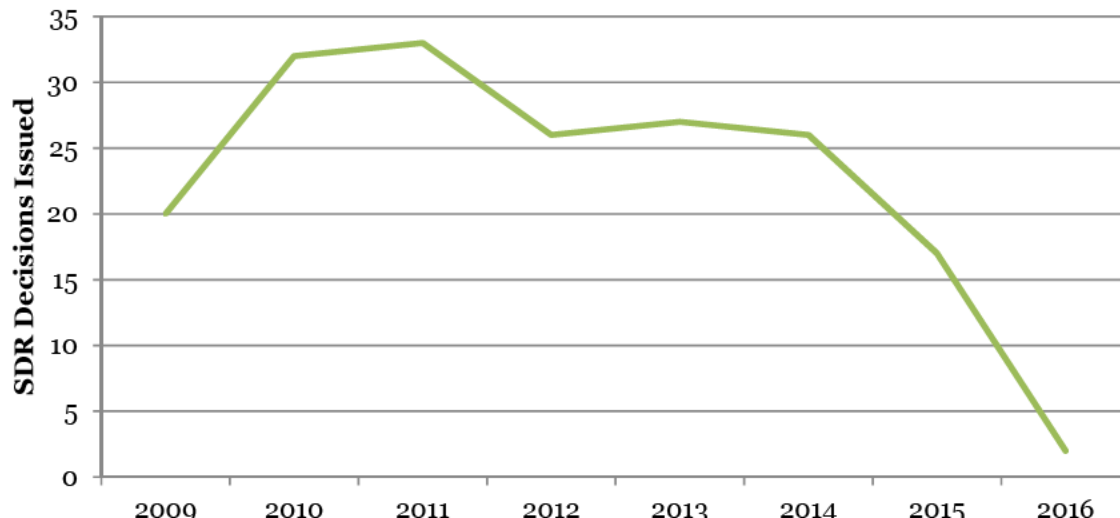
- The relative harm to the parties if the stay is granted or denied
- The likelihood of the appellant's success of the merits
- The likelihood of immediate and irreparable harm if the stay is not granted
- Whether the public interest favors granting the stay



SDR SUMMARY

(Final) SDR Decisions	Proportion of SDRs by Field Office											SDR Type		
	BFO	CFO	CYFO	KFO	LFO	NFO	PFO	RFO	RSFO	WFO	RMG	I&E	Engineering*	Environmental
20	80%	0%	0%	0%	0%	5%	5%	5%	0%	5%	0%	60%	5%	35%
32	72%	9%	3%	3%	0%	0%	0%	3%	9%	0%	0%	31%	9%	59%
33	67%	3%	3%	0%	0%	0%	12%	6%	6%	3%	0%	6%	18%	76%
26	50%	15%	0%	4%	8%	0%	8%	4%	4%	0%	8%	19%	38%	42%
27	59%	22%	0%	4%	0%	0%	4%	4%	0%	0%	4%	19%	22%	56%
26	65%	8%	0%	0%	4%	0%	4%	4%	12%	4%	0%	27%	42%	31%
17	53%	18%	0%	0%	0%	0%	0%	24%	0%	0%	6%	29%	59%	12%
2														
27.3	66%	10%	1%	2%	2%	1%	6%	4%	4%	2%	2%	27%	23%	33%

*Engineering includes approval of drilling and production operations, bond adequacy reviews, and reservoir management.



INTERIOR BOARD OF LAND APPEALS

IBLA decision on appeal constitutes the final decision of the Secretary of the Department of Interior

Appeals must be filed with the office of record within 30 business days of receipt of a decision.

Lease Sale protest decisions and NEPA adequacy complaints, State Director Review decisions, MLA Rights of Way, and Programmatic Oil and Gas EIS Record Of Decision's* are all appealed to IBLA.

SEVERAL AVENUES for PARTICIPATION

EIS level Annual Planning Meetings

Resource Advisory Council Meetings

Working Groups

Project Specific Public Outreach

Public Onsite Inspections



SUMMARY

- There are many opportunities for the public to be involved in the BLM oil and gas process.
- Land use planning stage
- Leasing stage
- Lease operations stage
- Other opportunities



QUESTIONS?

Thank you!

Have a great rest of your day



From: Cowan, Gregory
To: [Rob Mathes \(robert.mathes@dgslaw.com\)](mailto:Rob.Mathes@dgslaw.com); mgamper@blm.gov; njmiller@fs.fed.us; [Lowe, Philip \(philip.lowe@sol.doi.gov\)](mailto:Philip.Lowe@sol.doi.gov)
Cc: [Jessica Crowder](#)
Subject: Fluid-mineral leasing presentations
Date: Thursday, February 4, 2016 6:34:28 PM
Attachments: [20160126_Wyo_CC.PPTX](#)
[Participation in the Federal Oil and Gas Program MGAMPER.BLM_WSO.02042016.ppsx](#)

Good afternoon.

I said Monday, but with both presentations in hand (Nancy's will be a refresh of what is presented here, which will make an initial appearance during the LUP presentation) I want to get it out you now for reference.

Nice work. It's no small ask to distill the mineral discussion into the thematic ask, and to shrink it down to the allotted time. I believe you did, so thank you! Presentations will go out to attendees on Monday with a final logistical note. Unless we engage in the interim, that will be the last you hear from me until I see you on Wednesday.

Thanks again; I'm looking forward to the discussion.

Gregory

Gregory M. Cowan

Natural Resource Staff Attorney

Wyoming County Commissioners Association <<http://www.wyo-wcca.org/>>

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FOREST SERVICE ADMINISTRATIVE REVIEW PROCESSES

Wyoming County Commissioners
Association Meeting
February 10, 2016

Overview – The Rules

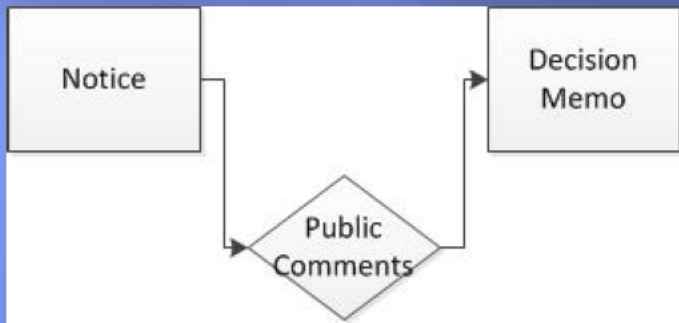
The Forest Service has three administrative review processes:

- 36 CFR 214 – Post-decisional **appeal** process for occupancy or use of NFS lands
- 36 CFR 218 – Pre-decisional **objection** process for projects and activities
- 36 CFR 219 – Pre-decisional **objection** process for forest planning

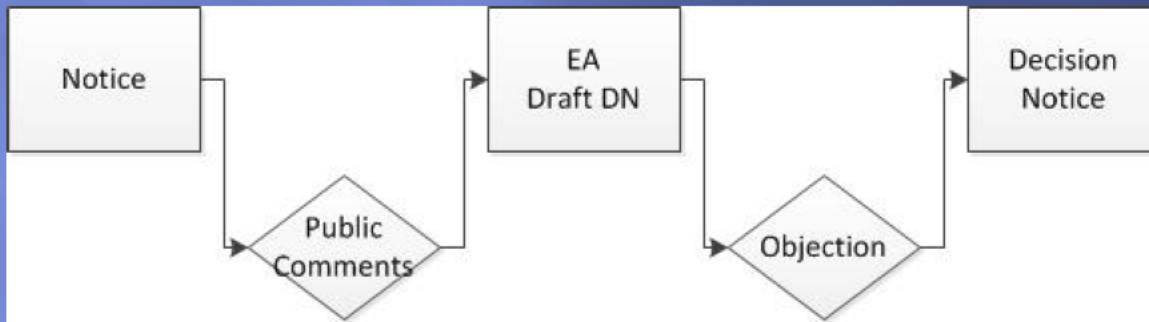
Why Objections?

- ▣ Early and continuing public involvement in the planning process
- ▣ Discussion with the public during and before the decision is made
- ▣ Both Decision maker and Reviewing Officer are involved in the review, helping to resolve, and otherwise responding to objection issues
- ▣ Increases likelihood of resolution

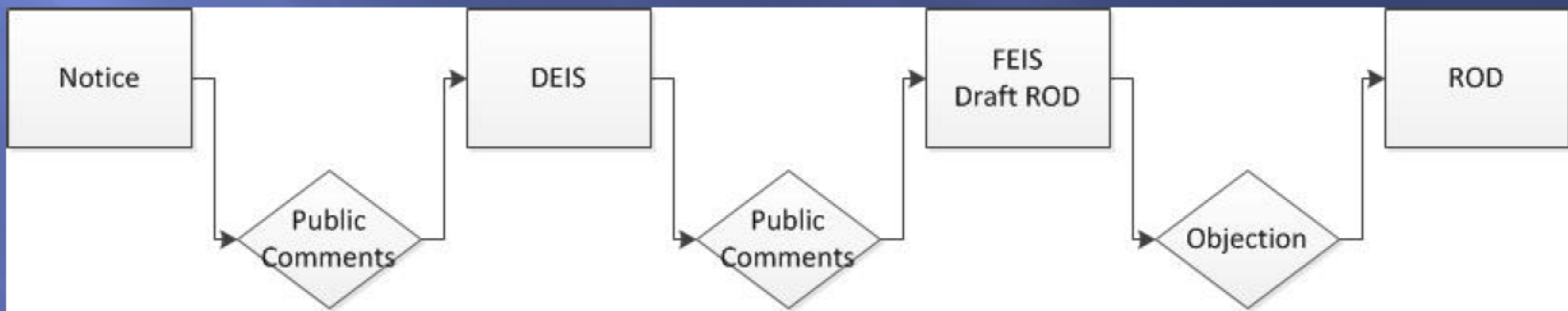
CE



EA



EIS



218/219 Comparison

	218	219
Objection Filing Period	45 days (30 for HFRA)	60 days-EIS 45 days-EA
Interested Persons	No	Yes
Objection Response Period	45 days (30 for HFRA)	90 days
Response extension	Up to 30 days	Undefined

Who may file an objection

- ▣ 218 - Individuals and entities who have submitted **timely specific** written comments during an opportunity for public comment
- ▣ 219 - Individuals and entities who have submitted **substantive formal** written comments during an opportunity for public comment
- ▣ Issues raised in objections must be based on previously submitted specific written comments, unless the issue is based on new information that arose after the opportunities to comment

Overview – Line Officer Engagement

- Dialogue between the Responsible Official and Reviewing Officer encouraged, not constrained
- Inclusion of Reviewing Officer and Responsible Official in resolution meetings
- Reviewing Officer is the line officer at the next higher administrative level above the Responsible Official
- **Reviewing Officer** has discretion to determine when, where, and how dialogue for resolution is conducted; **Responsible Official** should be an active participant in those conversations

Resolution Meetings

- ▣ The Reviewing Officer or objector(s) may request to meet to discuss issues and potential resolution
- ▣ 218-The Reviewing Officer has discretion to determine whether adequate time permits a resolution meeting
- ▣ Resolution meetings are open to the public but notification is not required
- ▣ 219-The Reviewing Officer must allow interested persons to participate
- ▣ 219-The Responsible Official must participate in all meetings involving the objectors

Resolution Meetings

- ▣ The Reviewing Officer has broad discretion to determine how the resolution meeting will be conducted
- ▣ Considerations:
 - Schedule enough time after the resolution meetings to consider information obtained in the meetings
 - Resolution meetings with all objectors or individually
 - Limit participation to objectors/interested persons
 - Focus the discussion on main issues
 - Multi-day meetings
 - Resolution - For the agency, this means either partial or full withdrawal of an objection

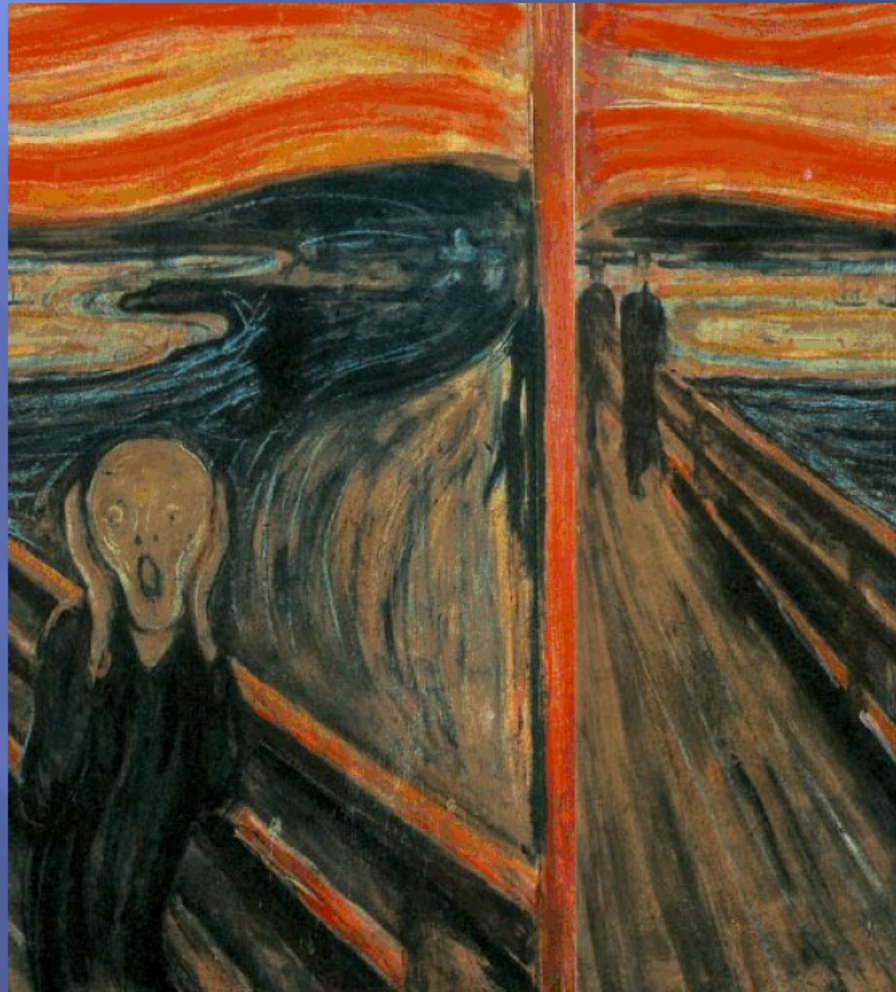
Concerns – Variability of Processes

- ▣ Each objection process is unique and varies based on a multiple factors
 - Reviewing Officer, Responsible Official and Administrative Review Coordinator
 - Number of objections
 - Variety of objectors – all environmentalists/industry representatives
 - Complexity of objection issues raised
 - Other ongoing objections

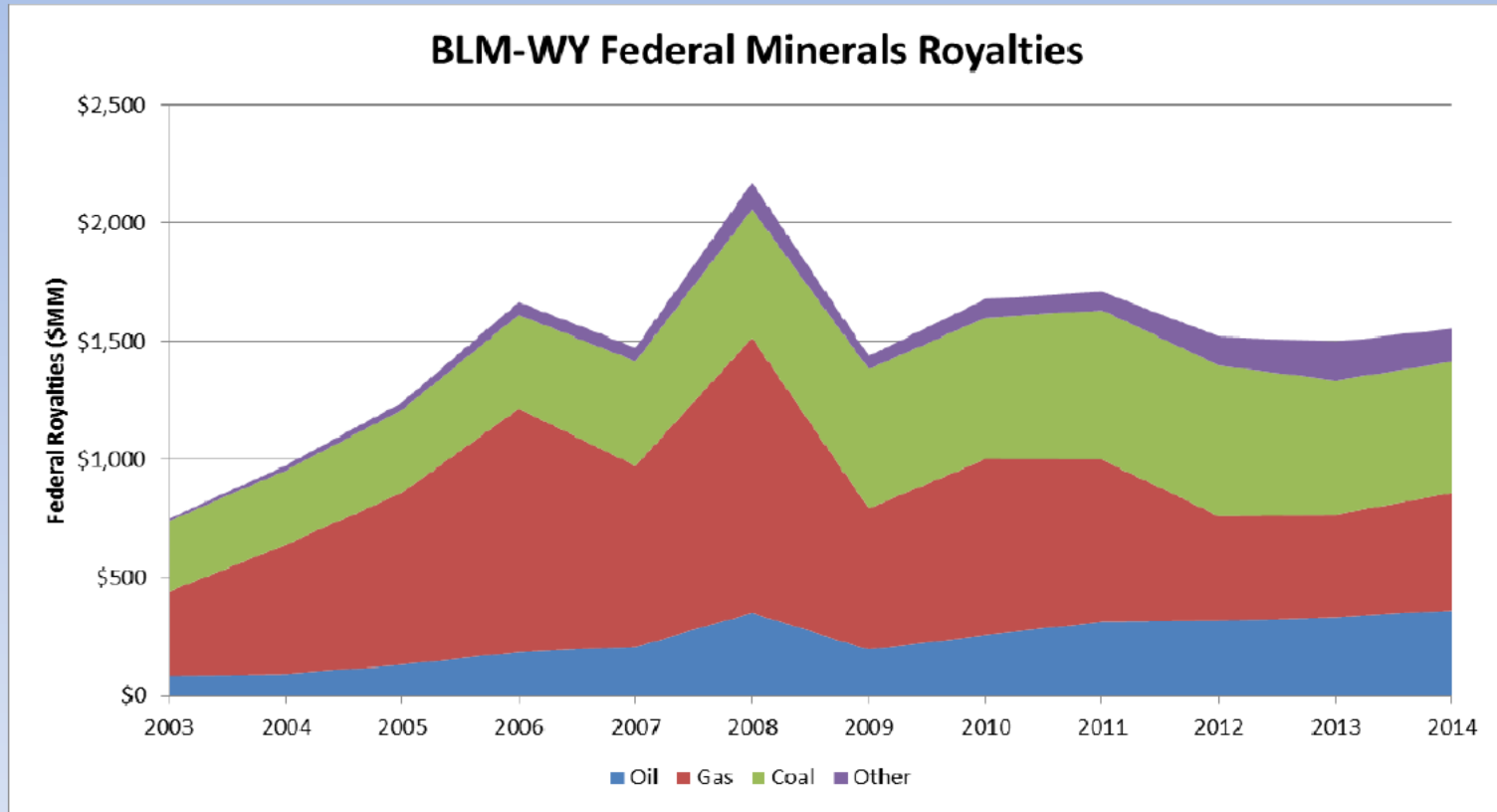
Concerns – Participation When Supportive of Project

- ▣ 218-Depends on how the Reviewing Officer utilizes their discretion on conducting resolution meetings
- ▣ 218-Only certain way to ensure participation is to object
- ▣ 219-Interested persons status will ensure participation in objection resolution meetings

Questions?



PARTICIPATION IN THE FEDERAL OIL AND GAS PROGRAM



Merry E. Gamper
 BLM-Wyoming State Office
 Fluid Mineral Program Lead
 February 10, 2016



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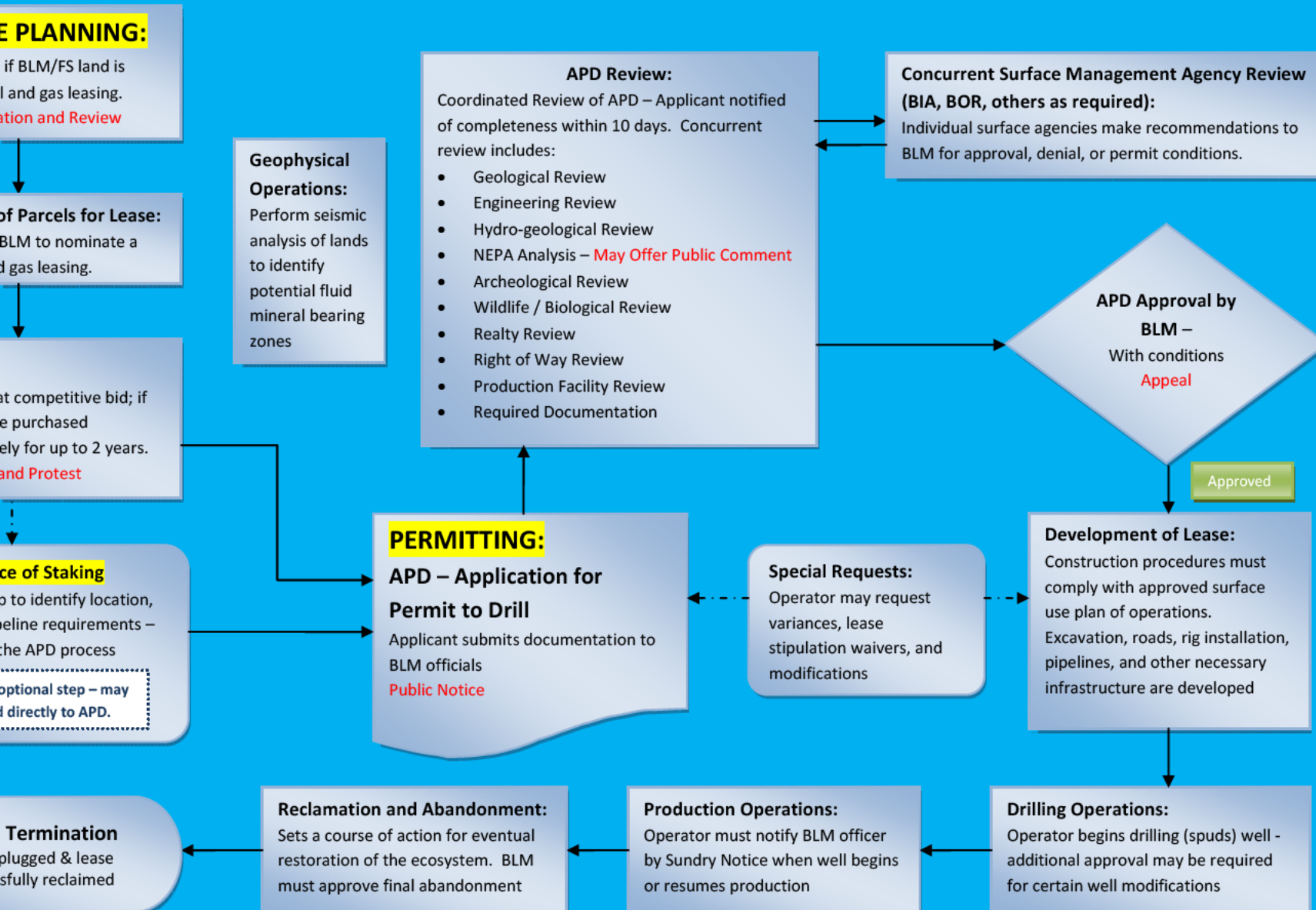


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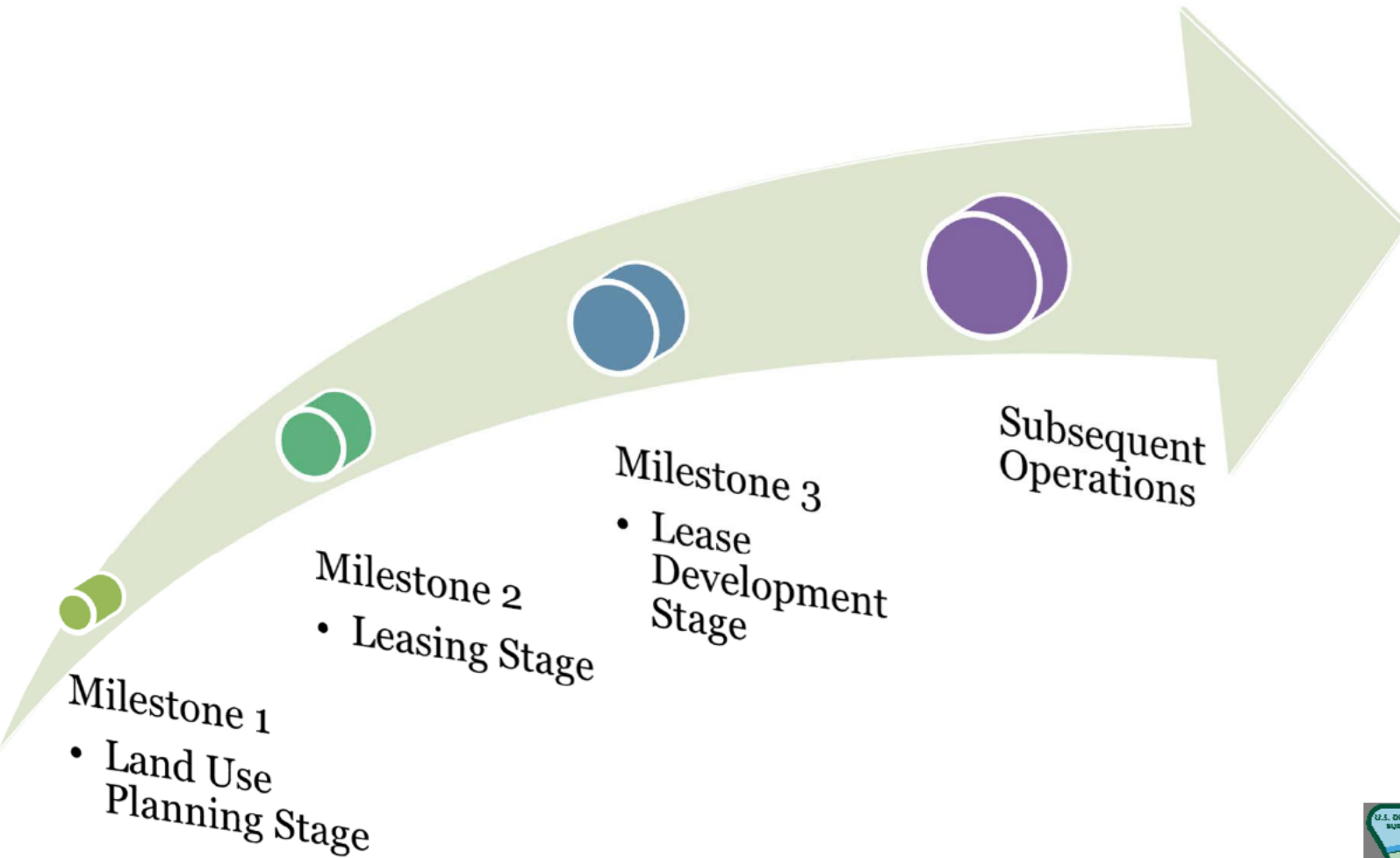
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OIL AND GAS DEVELOPMENT PROCESS



ARTICIPATION TIMELINE



ISSUES AND RESOLUTION

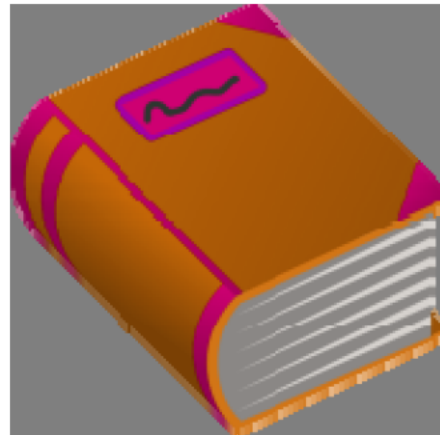
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LAND USE PLANNING

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- Reasonably Foreseeable Development Scenario
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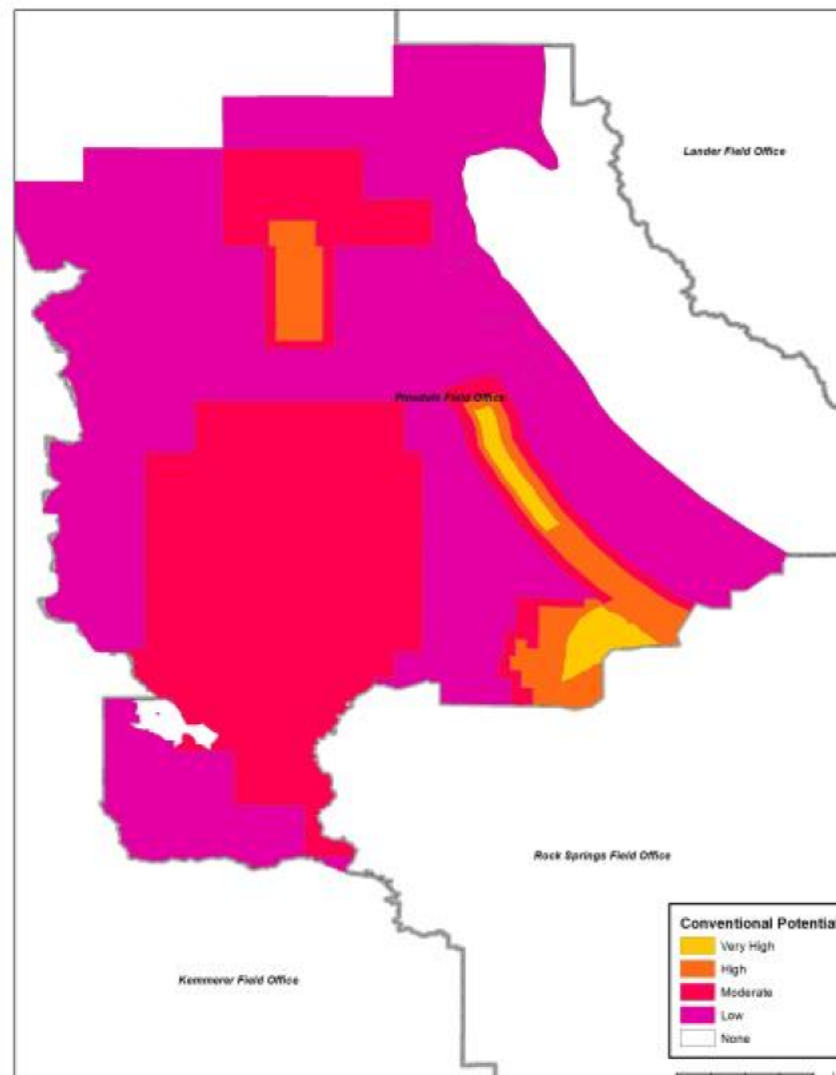
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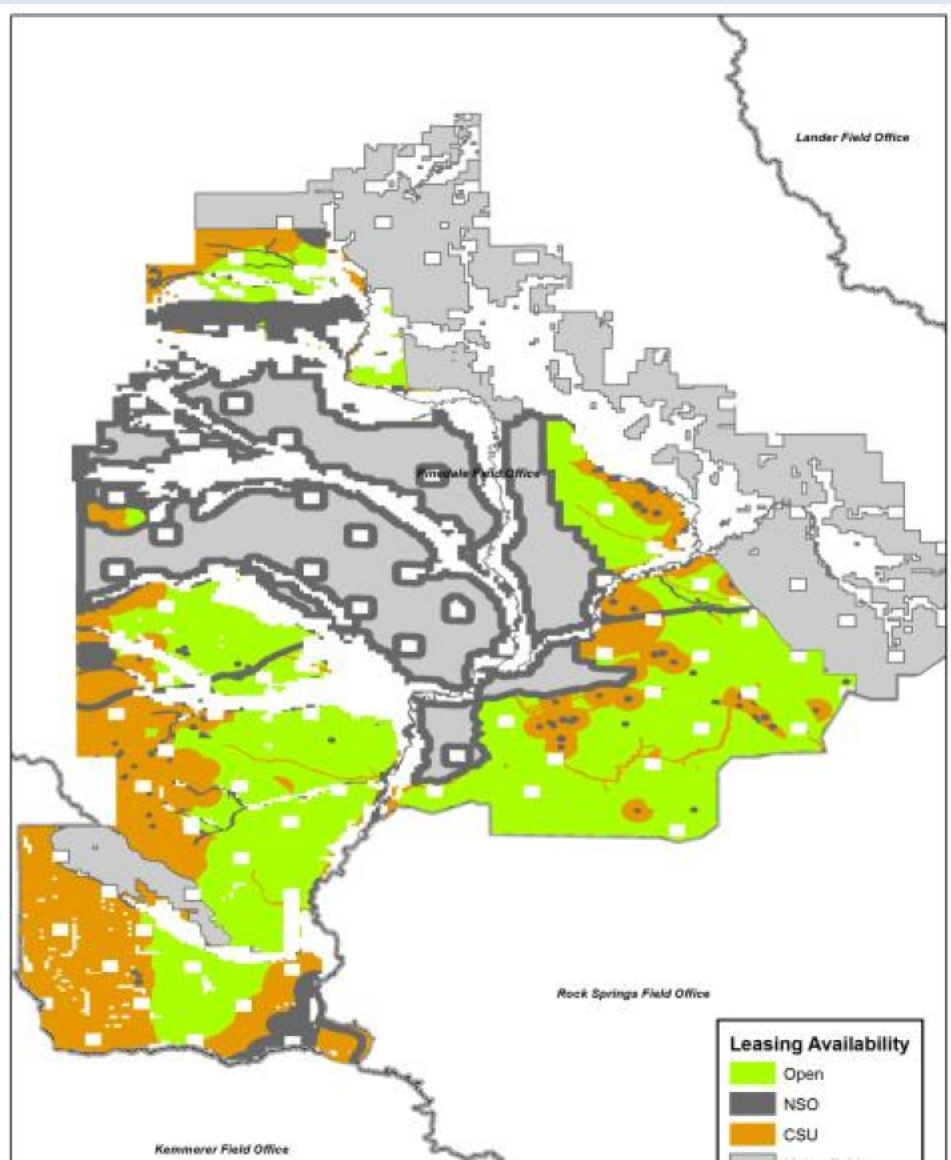
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LANDUSE PLAN AVAILABILITY



BLM - Wyoming



COMPETITIVE LEASING

BLM - Wyoming



FEDERAL ONSHORE OIL & GAS LEASING PROCESS MODEL

Minerals Leasing Act of 1920 and the 1987 Federal Onshore Oil and Gas Leasing Reform Act

BLM State Office: Conducts Lease Sales (at Least Quarterly)

(Regulations that govern the BLM's oil and gas leasing program may be found in Title 43, Groups 3000 & 3100)

ENERGY POLICY ACT 2005

Included in bid for competitive lease

Parcels identified by informal expressions of interest (EOI) by Industry.

Parcels identified by informal expressions of interest (EOI) by the public.

Existing oil & gas leases just expired, terminated, relinquished, cancelled, including 12 month old parcels received in over-the-counter applications.

Parcels identified by the BLM for land & resource management reasons.
Example: Protective leasing.

Field Office: Checks/Evaluates Parcels
for availability, other agency consent, potential resource conflicts and environmental issues.
Develops and makes recommendations for special stipulations and/or withdrawal from proposed offering.

Land Use Planning System

State Office: Consolidates List of Parcels.
Final Sale Notice posted at least 90 days prior to sale.

Land Use Plans (LUPs)
Analyze land uses and resources to determine what lands should be open to oil and gas leasing.

Additional Site-Specific Analysis
Occurs prior to exploration, ground disturbing activities, or development activity.

State Office: Competitive Sale -- Oral Auction

No Bid

Successful Bid

Lease Sale Environmental Reviews
Occur prior to lease sales to ensure consistency with LUPs and NEPA adequacy. Review may result in parcels being deferred for further analysis or environmental stipulations being placed on the lease

Leased

Lease available over-the-counter for 24 months

Filing Received

Issue Noncompetitive Lease (10 year primary term)

Lessee/Operator
Exploration Development Production Abandonment Reclamation

Fluid Minerals Program
Plans of development
Bonding- \$ 50,000.00/Lease
Assignments & Adjudication
Diligence
Production Verification
Collections
Unitization/Communication
Drainage
Plugging and abandonment
NEPA: EIS, EA, CA
Geophysical Permits
Rights-of-way
Gas storage
Development Contracts

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Abandonment
Reclamation

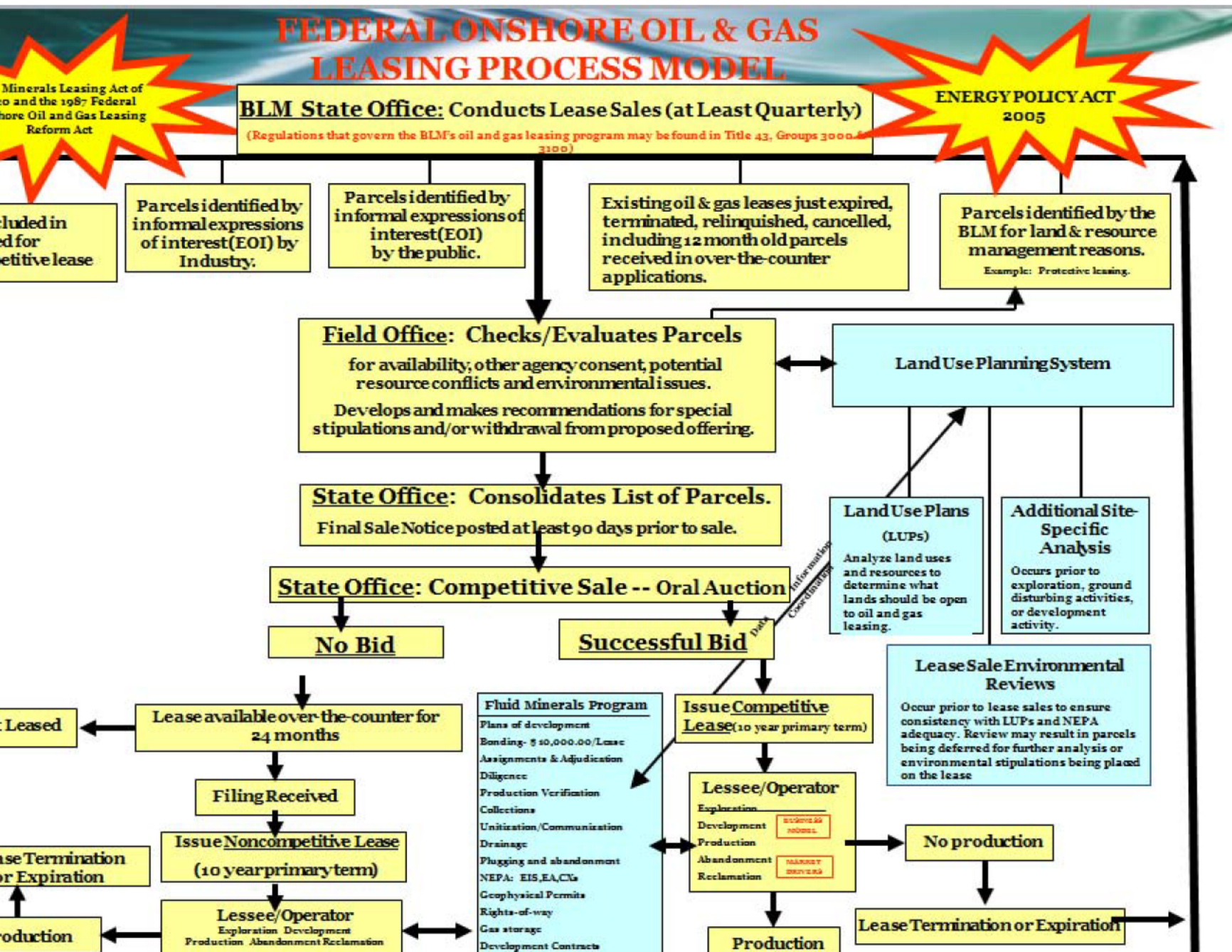
Production

No production

Lease Termination or Expiration

Lease Termination or Expiration

Production



LEASE SALES

Mandated to Conduct Lease Sales (at least) Quarterly

BLM conducts an Internal interdisciplinary review

BLM determines if:

- There is significant new information
- The proposal is in conformance with the plan
- Parcels are Available for offering

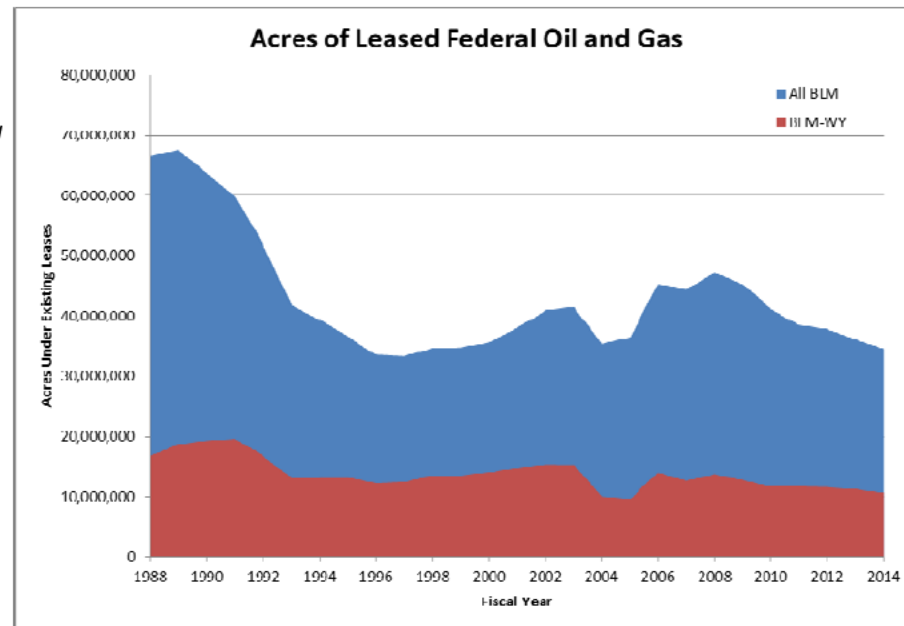
BLM provides for surface inspection of lease parcels

State agency coordination



LEASE PARCEL NOMINATIONS AND SALE

Washington Office
Construction Memorandum
10-117: Oil and Gas Leasing
reform – Land Use Planning
and Lease Parcel Reviews
Landowner and SMA
Notification Letters
30-day formal Public Comment
period



Test Period (43 C.F.R. §4.450-
and 43 C.F.R. § 3120)

Superior Board of Land Appeals

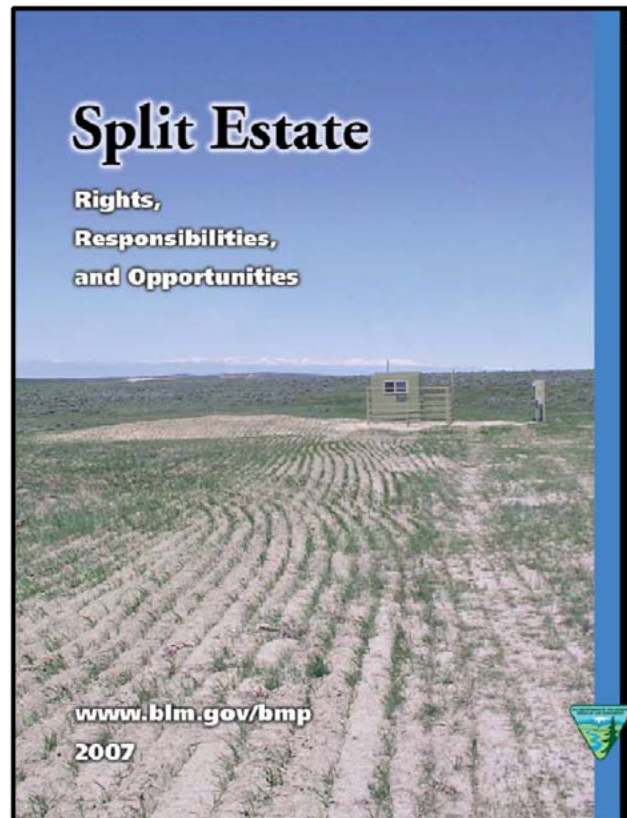


LEASING ISSUES

Split Estate Leasing

Energy Policy Act of 2005 and 2006
Split Estate Report to Congress:
The BLM will now provide courtesy
notification to surface owners when
split estate lands are included in a
lease sale

▶ Parties submitting an Expression of
Interest (EOI) are now required to
provide BLM with the name and address
of any surface owners where split estate
lands are included in their EOI.



EASE SALE PROTESTS AND APPEALS

30 day protest period

Protests must be timely

Sale Book must be posted 45/90 days prior to sale

Protests must state the interest of the party filing

Protests may not be emailed but can filed hardcopy and/or faxed.

- o Petitioners if faxing a protest, should call to ensure it was received.

Similar to land use plan protests, participation in the decision making process is generally required when a protestor is challenging on NEPA grounds.



LEASE STIPULATION WAIVERS OR MODIFICATIONS

43 C.F.R. § 3101.1-4

- o If the authorized officer has determined, prior to lease issuance, that a stipulation involves an issue of major concern to the public, modification or waiver of the stipulation shall be subject to public review for at least a 30-day period. In such cases, the stipulation shall indicate that public review is required before modification or waiver.
- o If subsequent to lease issuance the authorized officer determines that a modification or waiver of a lease term or stipulation is substantial, the modification or waiver shall be subject to public review for at least a 30-day public period.



LEASE REINSTATEMENTS

Washington Office Instruction Memorandum 2013-177:
*NEPA Compliance for Oil and Gas Lease Reinstatement
Petitions*

Before approving or denying an oil and gas lease
reinstatement petition, all Bureau of Land Management
(BLM) offices must review applicable RMPs and NEPA
documentation to:

- Ensure reinstatement of the lease would be in conformance with the existing RMP, including consent of SMA as necessary.
- Evaluate the adequacy of existing NEPA analysis and documentation related to the lease parcel; and
- Complete any necessary new or supplemental NEPA analysis and documentation.
- Intent to reinstate has to be published in the Federal Register

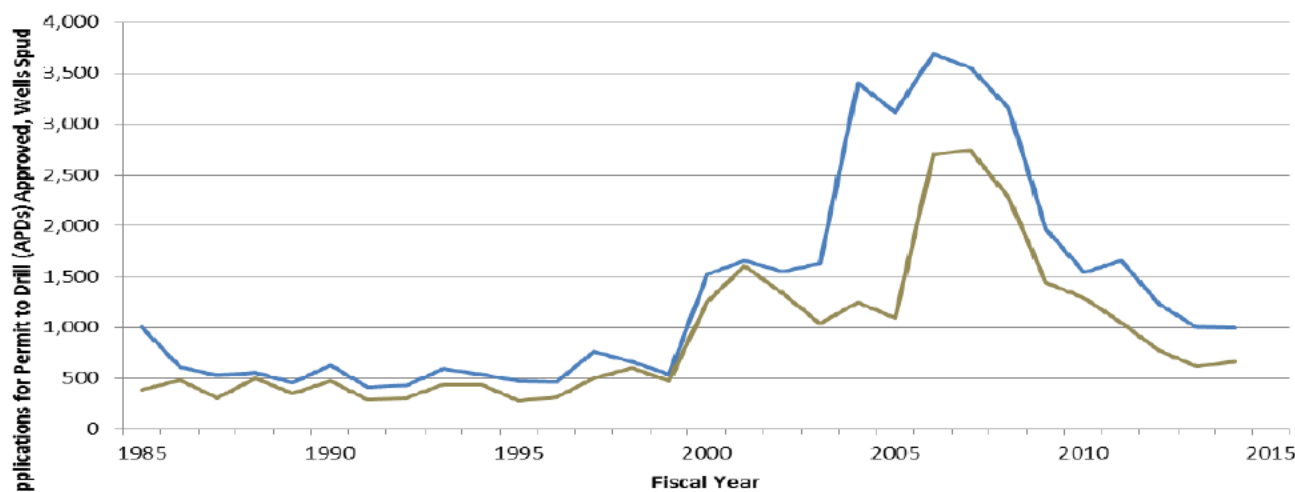


EASE OPERATIONS

Application for Permit to Drill

- “The operator shall submit to the authorized officer for approval an Application for Permit to Drill for each well. No drilling operations, nor surface disturbance preliminary thereto, may be commenced prior to the authorized officer’s approval of the permit.” (43 C.F.R. §3162.3-1(c))

**Number of APDs Approved, Federal Wells Spud:
BLM-Wyoming**



WELL AUTHORIZATIONS

43 C.F.R. §3162.3-1(g):

- “For Federal lands, upon receipt of the [APD] or [NOS], the authorized officer shall post the following information for public inspection at least 30 days before the action to approve the [APD]...”

see also: Onshore Order No. 1 (III)(E)(1)

Internet postings, in some states/offices

FOIA



REQUEST FOR STATE DIRECTOR REVIEW

43 C.F.R. § 3165.3(b) and Washington Office Instruction Memorandum 2011-141: *Procedures for Responding to Requests for State Director Review following Certain Oil and Gas Operation Decisions.*

- SDR can be requested by any adversely affected party from any instruction, order or decision issued under the regulations in 43 C.F.R. § 3160, Onshore O&G Operations, or 43 C.F.R. § 3180, Onshore O&G Unit Agreements-Unproven Areas.
- Must be filed with the State Directors Office with all supporting documentation within 20 business day. May request additional time to provide supporting materials for good cause.
- Petitioner may request an Oral Presentation and the AOs decision remains in effect until stayed, modified or overturned.



STATE DIRECTOR REVIEW cont.

Petitioners can request a Stay of the decision pending resolution of the SDR.

Decision on Stay will be based upon the potential for permanent harm if the decision remains in full force and effect.

In order to determine the potential for permanent harm, BLM considers the same criteria used by the Interior Board of Land Appeals. Petitioner must meet at least one.

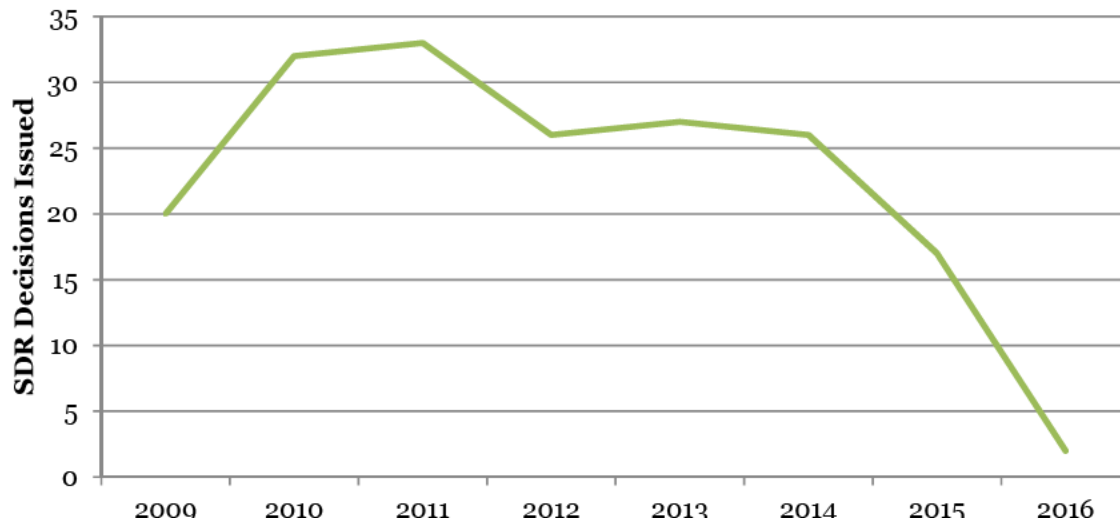
- The relative harm to the parties if the stay is granted or denied
- The likelihood of the appellant's success of the merits
- The likelihood of immediate and irreparable harm if the stay is not granted
- Whether the public interest favors granting the stay



SDR SUMMARY

(Final) SDR Decisions	Proportion of SDRs by Field Office											SDR Type		
	BFO	CFO	CYFO	KFO	LFO	NFO	PFO	RFO	RSFO	WFO	RMG	I&E	Engineering*	Environmental
20	80%	0%	0%	0%	0%	5%	5%	5%	0%	5%	0%	60%	5%	35%
32	72%	9%	3%	3%	0%	0%	0%	3%	9%	0%	0%	31%	9%	59%
33	67%	3%	3%	0%	0%	0%	12%	6%	6%	3%	0%	6%	18%	76%
26	50%	15%	0%	4%	8%	0%	8%	4%	4%	0%	8%	19%	38%	42%
27	59%	22%	0%	4%	0%	0%	4%	4%	0%	0%	4%	19%	22%	56%
26	65%	8%	0%	0%	4%	0%	4%	4%	12%	4%	0%	27%	42%	31%
17	53%	18%	0%	0%	0%	0%	0%	24%	0%	0%	6%	29%	59%	12%
2														
27.3	66%	10%	1%	2%	2%	1%	6%	4%	4%	2%	2%	27%	23%	33%

*Engineering includes approval of drilling and production operations, bond adequacy reviews, and reservoir management.



INTERIOR BOARD OF LAND APPEALS

IBLA decision on appeal constitutes the final decision of the Secretary of the Department of Interior

Appeals must be filed with the office of record within 30 business days of receipt of a decision.

Lease Sale protest decisions and NEPA adequacy complaints, State Director Review decisions, MLA Rights of Way, and Programmatic Oil and Gas EIS Record Of Decision's* are all appealed to IBLA.

OTHER AVENUES for PARTICIPATION

EIS level Annual Planning Meetings

Resource Advisory Council Meetings

Working Groups

Project Specific Public Outreach

Public Onsite Inspections



SUMMARY

- There are many opportunities for the public to be involved in the BLM oil and gas process.
- Land use planning stage
- Leasing stage
- Lease operations stage
- Other opportunities



QUESTIONS?

Thank you!

Have a great rest of your day



From: Gamper, Merry
To: [Cowan, Gregory](#)
Subject: Re: remedies forum presentation
Date: Tuesday, February 9, 2016 11:19:59 AM
Attachments: [Participation in the Federal Oil and Gas Program_MGAMPER.BLM_WSO.02042016v2.pptx](#)

Attached. Is there a problem with the powerpoint show that I sent?

-Merry

Merry E. Gamper
Fluid Minerals Program Lead (WY921)
Wyoming State Office
5353 Yellowstone
Cheyenne, WY 82001
307.775.6272
mgamper@blm.gov

On Mon, Feb 8, 2016 at 3:25 PM, Cowan, Gregory <gcowan@wyo-wcca.org> wrote:

Hi Merry,

Is it possible to send your presentation as a PowerPoint (.pptx) rather than its current form (.pts)?

Gregory

Gregory M. Cowan

Natural Resource Staff Attorney

Wyoming County Commissioners Association <<http://www.wyo-wcca.org/>>

O: 307.632.5409

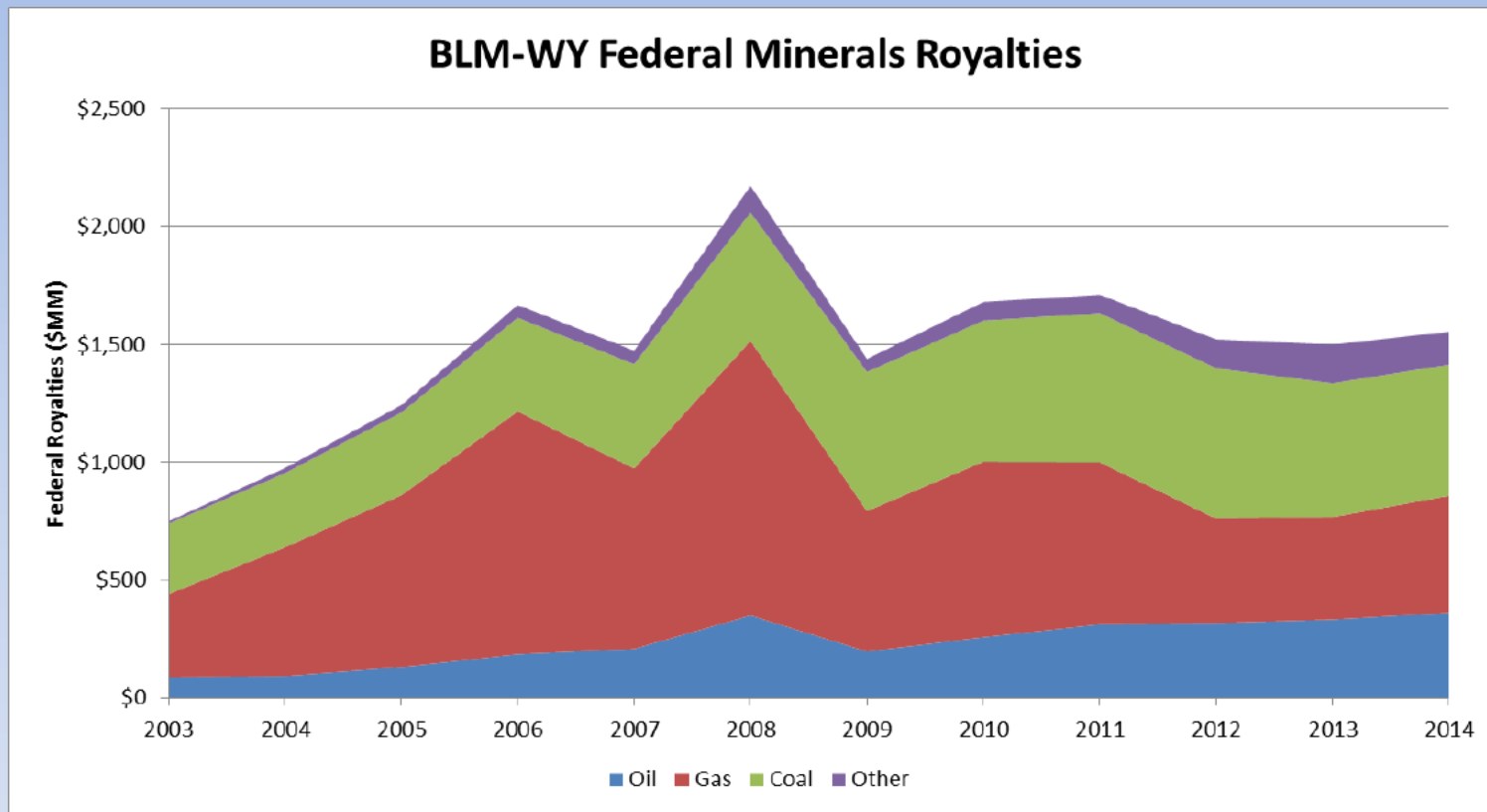
C: 307.275.4746

F: 307.632.6533

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please notify the sender and delete the email immediately.

PARTICIPATION IN THE FEDERAL OIL AND GAS PROGRAM



Merry E. Gamper
 BLM-Wyoming State Office
 Fluid Mineral Program Lead
 February 10, 2016



OVERVIEW

- Provide information about when and how participation in the administration of the Federal Oil and Gas Program can occur.
- For operations on other Surface Management Agency (SMA) lands, BLM cannot take action without the consent of the SMA. Technical and NEPA reviews are limited to downhole operations.



THE PUBLIC

- Vested interest in the management of public lands.
- Has an interest in protecting and/or promoting a wide array of often competing uses for public lands.

PRIVATE SURFACE OWNERS

- The surface owner has rights accorded them by law and under the patent reserving mineral estate to the United States.
- Participation in onsite, accommodation of reasonable requests.
- Has an interest in protecting private property and lifestyle, and in possibly benefitting from activities.



STATUTORY AUTHORITIES

- Mineral Leasing Act (30 U.S.C. 181 *et seq.*)
- Title 43 Code of Federal Regulations Part 3000
- National Environmental Policy Act (42 U.S.C. 4321 *et seq.*)
- Others
 - Federal Land Policy Management Act,
 - Stockraising Homestead Act,
 - 2005 Energy Policy Act, etc.



OIL AND GAS DEVELOPMENT PROCESS

LAND USE PLANNING:

Determination if BLM/FS land is available for oil and gas leasing.
Public Participation and Review

Nomination of Parcels for Lease:

Submission to BLM to nominate a tract for oil and gas leasing.

LEASING:

Lease offered at competitive bid; if not sold, can be purchased noncompetitively for up to 2 years.
Public Review and Protest

Geophysical Operations:

Perform seismic analysis of lands to identify potential fluid mineral bearing zones

APD Review:

Coordinated Review of APD – Applicant notified of completeness within 10 days. Concurrent review includes:

- Geological Review
- Engineering Review
- Hydro-geological Review
- NEPA Analysis – **May Offer Public Comment**
- Archeological Review
- Wildlife / Biological Review
- Realty Review
- Right of Way Review
- Production Facility Review
- Required Documentation

Concurrent Surface Management Agency Review (BIA, BOR, others as required):

Individual surface agencies make recommendations to BLM for approval, denial, or permit conditions.

APD Approval by BLM –
With conditions
Appeal

Approved

NOS – Notice of Staking

Optional step to identify location, access, & pipeline requirements – streamlines the APD process

NOS is an optional step – may proceed directly to APD.

PERMITTING:

APD – Application for Permit to Drill

Applicant submits documentation to BLM officials
Public Notice

Special Requests:

Operator may request variances, lease stipulation waivers, and modifications

Development of Lease:

Construction procedures must comply with approved surface use plan of operations. Excavation, roads, rig installation, pipelines, and other necessary infrastructure are developed

Lease Termination

Wells plugged & lease successfully reclaimed

Reclamation and Abandonment:

Sets a course of action for eventual restoration of the ecosystem. BLM must approve final abandonment

Production Operations:

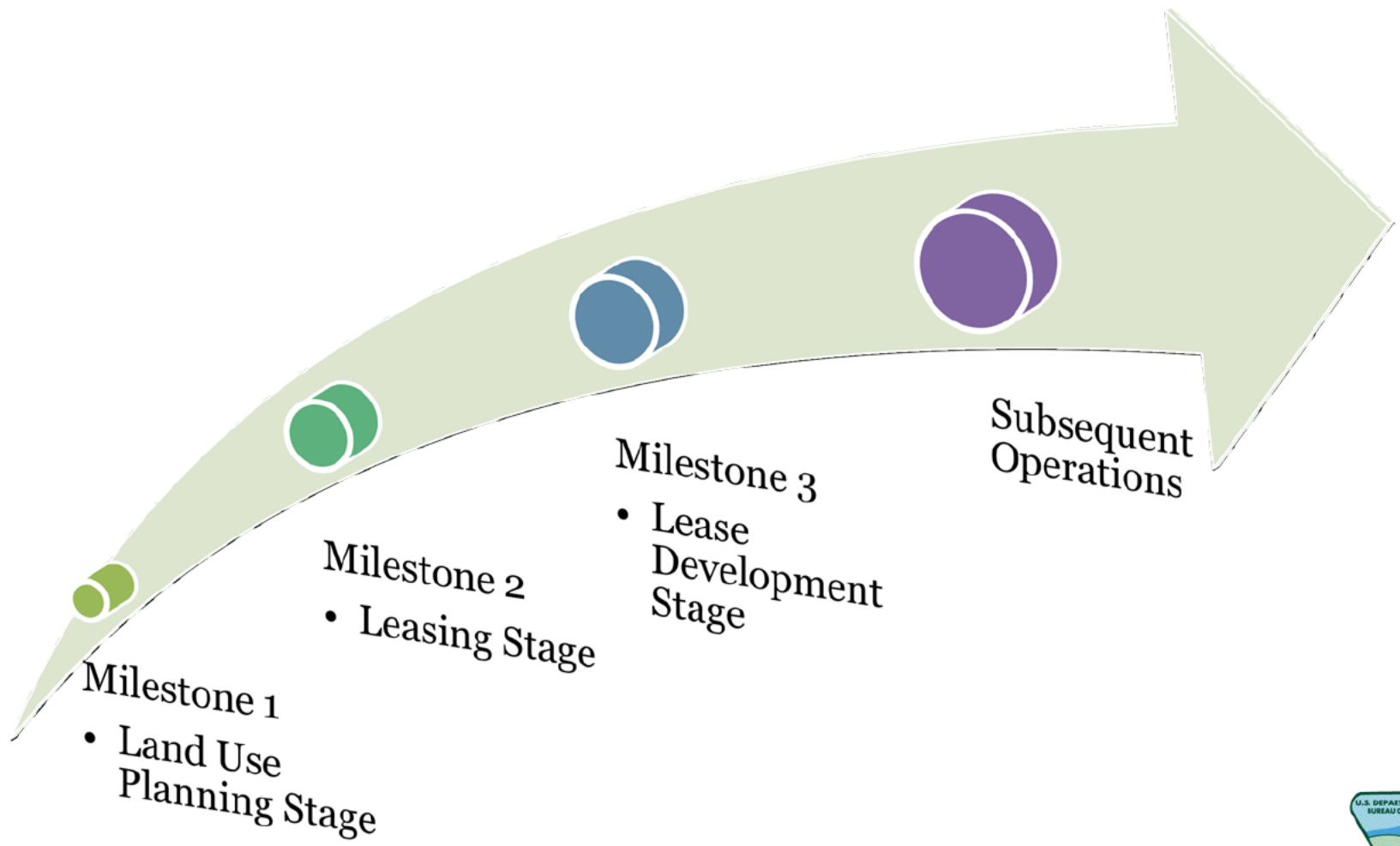
Operator must notify BLM officer by Sundry Notice when well begins or resumes production

Drilling Operations:

Operator begins drilling (spuds) well - additional approval may be required for certain well modifications

INSPECTION & ENFORCEMENT and MONITORING

PARTICIPATION TIMELINE



ISSUES

- NEPA
 - Hard look standard
 - Scope
 - Ripeness
- Regulatory Authority
 - Arbitrary and Capricious
 - Violation of Valid Existing Lease Rights
- Procedures/Process



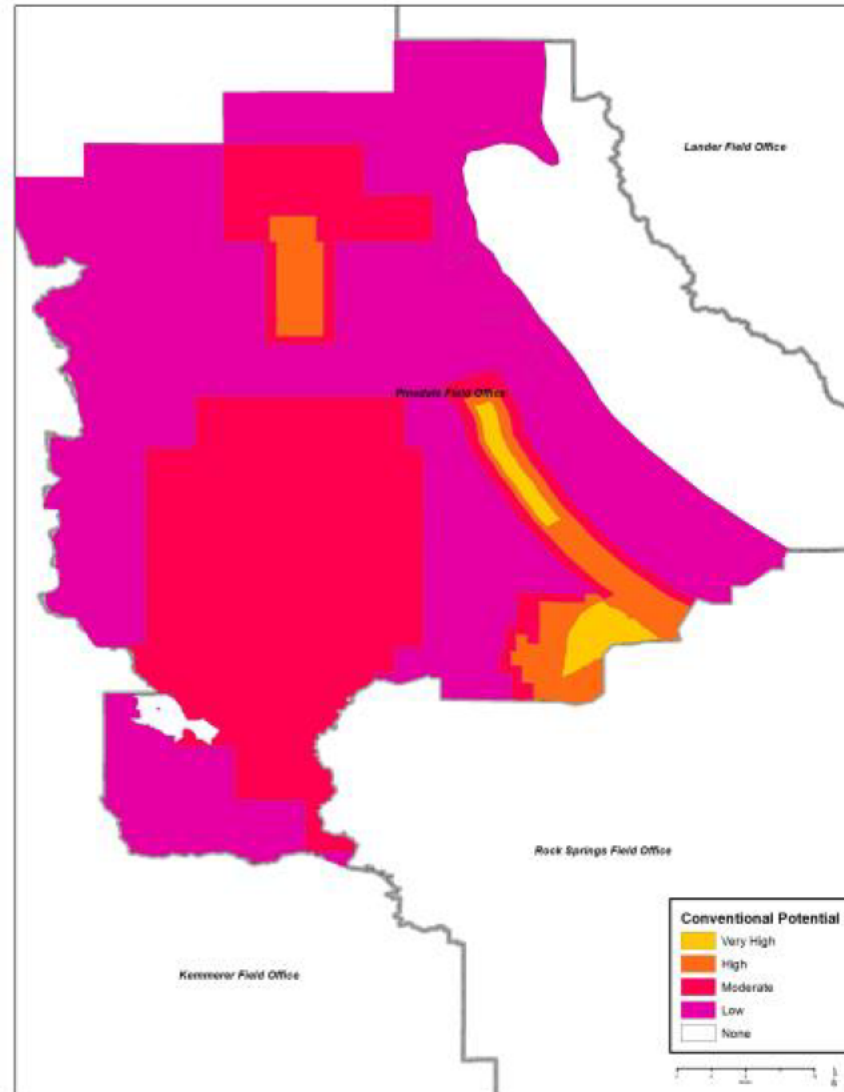
LANDUSE PLANNING

- Planning for Fluid Minerals Handbook
 - Reasonably Foreseeable Development Scenario
 - Allocations
 - Open or Unavailable
 - Constraints
 - » Minor
 - » Moderate
 - » Major

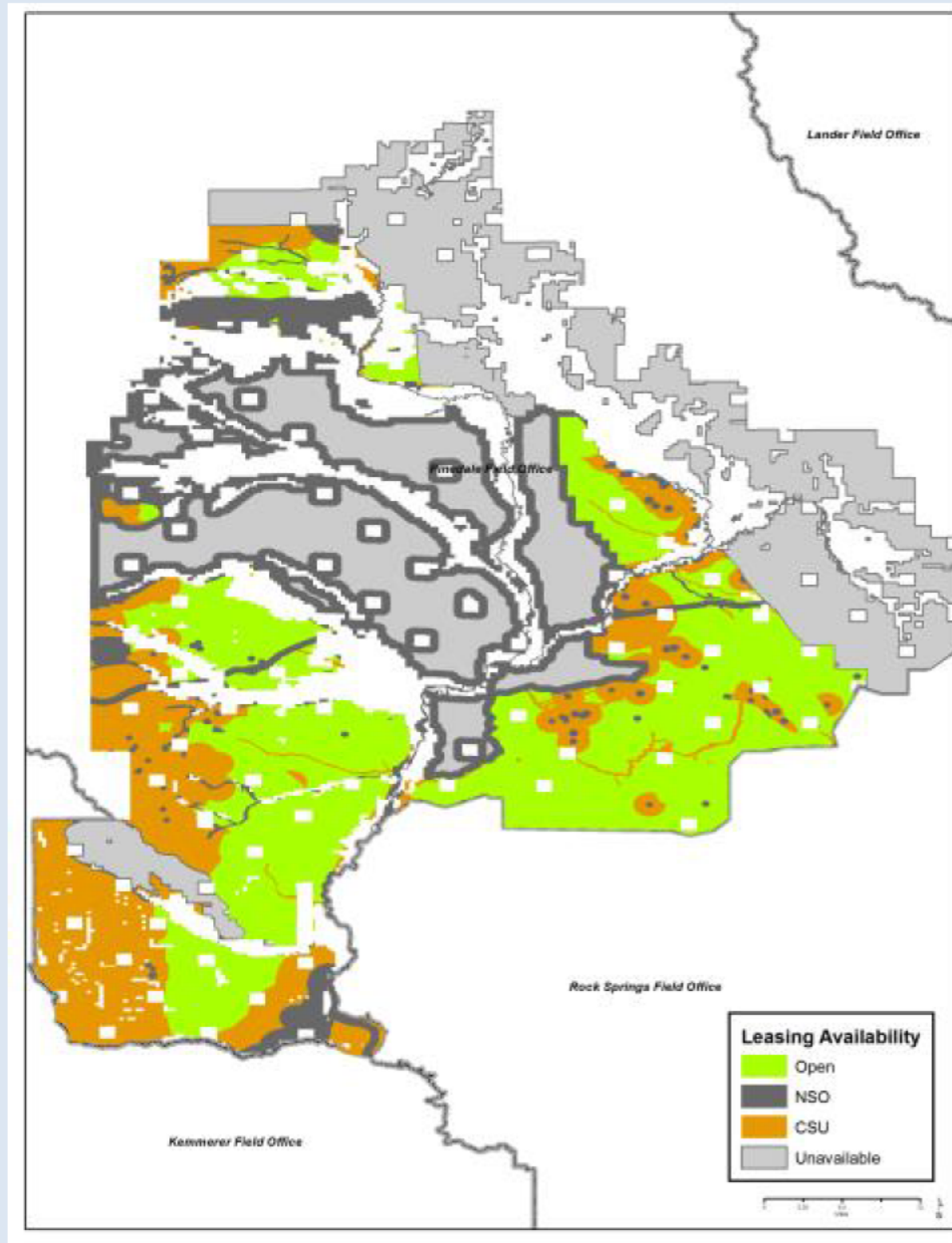


REASONABLY FORESEEABLE DEVELOPMENT POTENTIAL

- Reasonably Foreseeable Development Potential Report.
- Baseline and Alternative by Alternative Comparison.
- Used to project expected impacts from allocation decisions and subsequent development.



LANDUSE PLAN AVAILABILITY



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Production

Production

Lease Termination or Expiration

Follow up by
Case histories

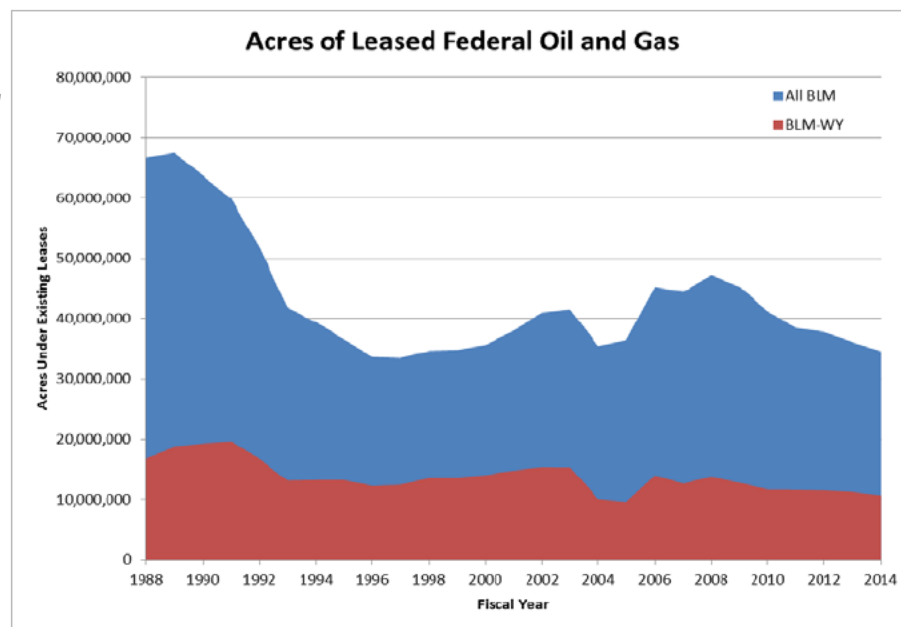
LEASE SALES

- Mandated to Conduct Lease Sales (at least) Quarterly
 - District Office Rotation 2X/year
- BLM conducts an Internal interdisciplinary review
- BLM determines if:
 - Parcels are Available for offering
 - The proposal is in conformance with the plan
 - There is significant new information
- BLM provides for surface inspection of lease parcels
- State and/Federal agency coordination



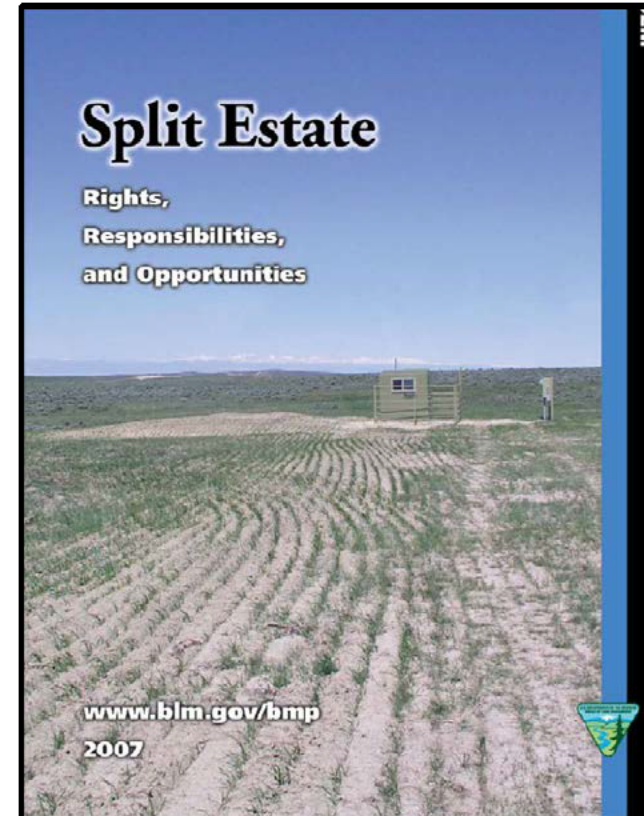
LEASE PARCEL NOMINATIONS AND SALE

- Washington Office
Instruction Memorandum
2010-117: *Oil and Gas Leasing Reform – Land Use Planning and Lease Parcel Reviews*
 - Landowner and SMA
Notification Letters
 - Posting of NEPA documents
 - 30-day formal Public Comment period
- Protest Period (43 C.F.R.§4.450-2 and 43 C.F.R.§ 3120)
- Interior Board of Land Appeals



LEASING ISSUES

- Split Estate Leasing
 - Energy Policy Act of 2005 and 2006 Split Estate Report to Congress:
The BLM will now provide courtesy notification to surface owners when split estate lands are included in a lease sale
- Parties submitting an Expression of Interest (EOI) are now required to provide BLM with the name and address of any surface owners where split estate lands are included in their EOI.



LEASE SALE PROTESTS AND APPEALS

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LEASE REINSTATEMENTS

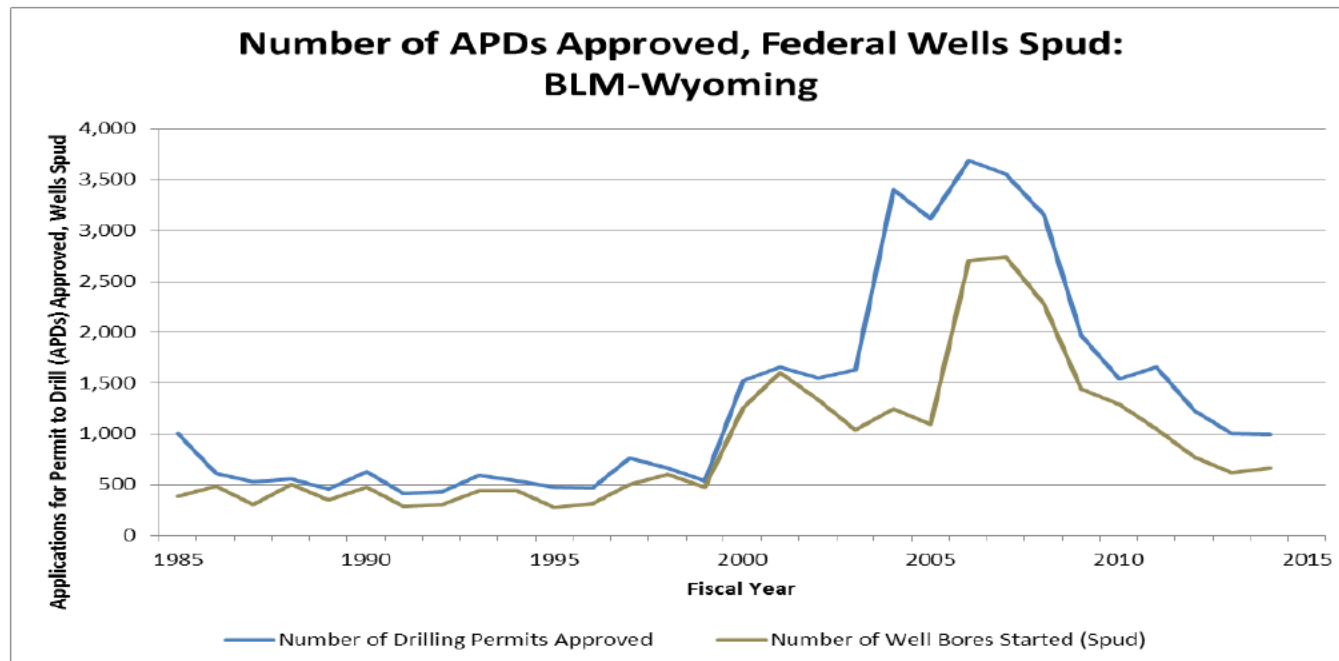
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 - Evaluate the adequacy of existing NEPA analysis and documentation related to the lease parcel; and
 - Complete any necessary new or supplemental NEPA analysis and documentation.
 - Intent to reinstate has to be published in the Federal Register



LEASE OPERATIONS

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 - “The operator shall submit to the authorized officer for approval an Application for Permit to Drill for each well. No drilling operations, nor surface disturbance preliminary thereto, may be commenced prior to the authorized officer’s approval of the permit.” (43 C.F.R. §3162.3-1(c))



WELL AUTHORIZATIONS

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- *see also*: Onshore Order No. 1 (III)(E)(1)
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REQUEST FOR STATE DIRECTOR REVIEW

- 43 C.F.R. § 3165.3(b) and Washington Office Instruction Memorandum 2011-141: Procedures for Responding to Requests for State Director Review following Certain Oil and Gas Operation Decisions.
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STATE DIRECTOR REVIEW cont.

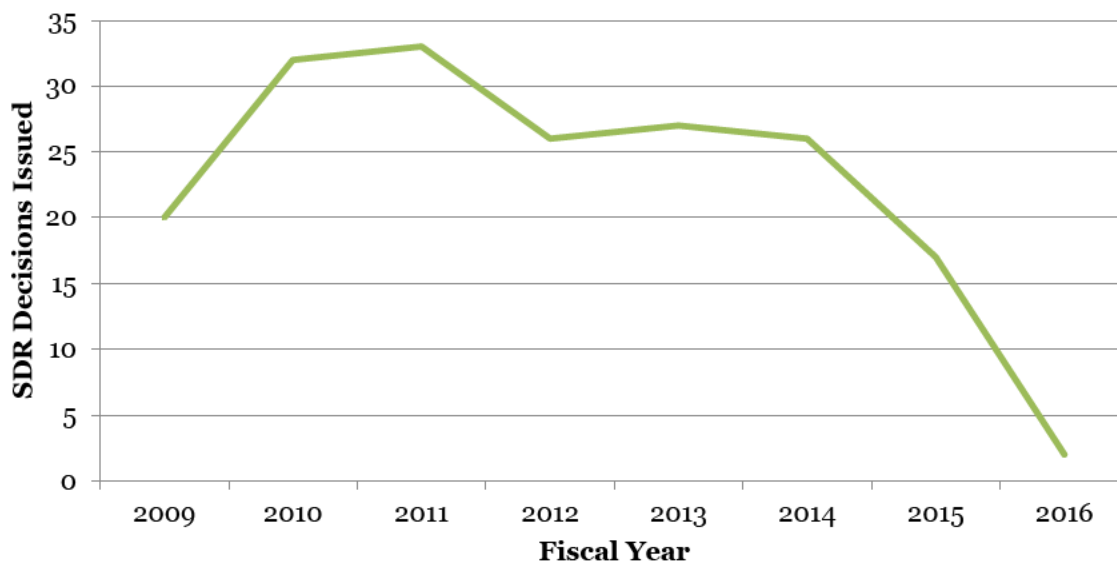
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 - The likelihood of immediate and irreparable harm if the stay is not granted
 - Whether the public interest favors granting the stay



SDR SUMMARY

FY	(Final) # SDR Decisions	Proportion of SDRs by Field Office											SDR Type		
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2011	33	67%	3%	3%	0%	0%	0%	12%	6%	6%	3%	0%	6%	18%	76%
2012	26	50%	15%	0%	4%	8%	0%	8%	4%	4%	0%	8%	19%	38%	42%
2013	27	59%	22%	0%	4%	0%	0%	4%	4%	0%	0%	4%	19%	22%	56%
2014	26	65%	8%	0%	0%	4%	0%	4%	4%	12%	4%	0%	27%	42%	31%
2015	17	53%	18%	0%	0%	0%	0%	0%	24%	0%	0%	6%	29%	59%	12%
2016	2														
Avg.:	27.3	66%	10%	1%	2%	2%	1%	6%	4%	4%	2%	2%	27%	23%	33%

*Engineering includes approval of drilling and production operations, bond adequacy reviews, and reservoir management.



INTERIOR BOARD OF LAND APPEALS

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- Appeals must be filed with the office of record within 30 business days of receipt of a decision.
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OTHER AVENUES for PARTICIPATION

- Programmatic EIS Development
- Programmatic EIS Implementation/Annual Planning Meetings
- Resource Advisory Council Meetings
- Working Groups
- Project Specific Public Outreach
- Public Onsite Inspections



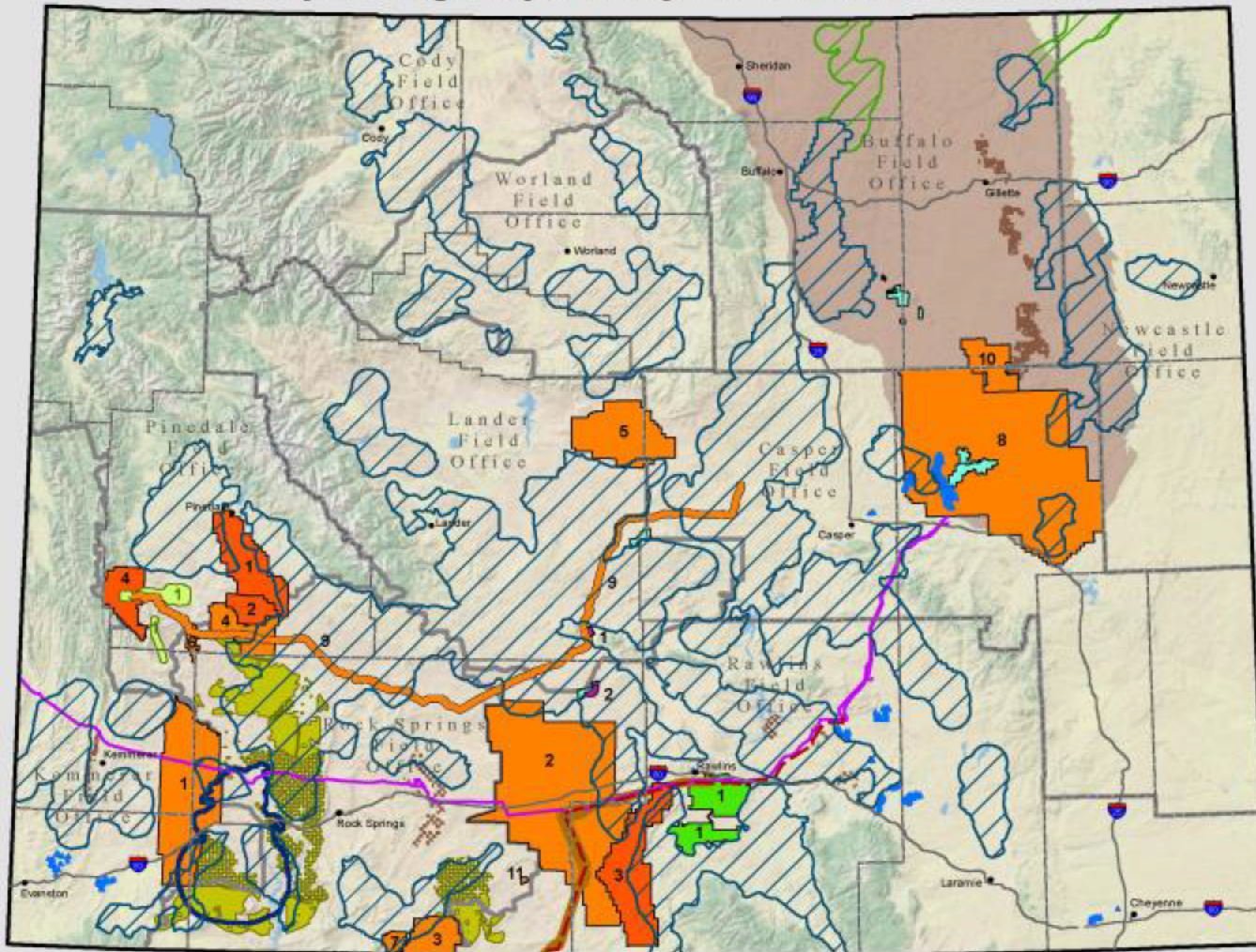
SUMMARY

- There are many opportunities for the public to be involved in the BLM oil and gas process.
- Land use planning stage
- Leasing stage
- Lease operations stage
- Programmatic NEPA stage
- Other



Current NEPA Projects Under Review

BLM Wyoming Major Projects November 2015



- Field Office Boundaries
 - County Boundaries
 - Powder River Basin Coal Area
 - Known Sodium Leasing Area (Trona)
 - Sage Grouse Core Area (Version 3)
 - Sage Grouse Connectivity Area
 - Active Coal Leases
 - Leasable Oil Shale Area
 - Approved Uranium Mine
 - Existing Wind Turbine
- Transmission Line Projects**
- Energy Gateway South (EGS) Proposed
 - Gateway West Approved Route
 - Transwest Express Preferred Corridor
- NEPA Projects**
- Pending O&G Development Project**
 - 1 Blacks Fork
 - 2 Continental Divide-Creston Natural Gas
 - 3 Hawatha Field
 - 4 Normally-Pressured Lance Natural Gas
 - 5 Moneta Divide Natural Gas and Oil Develop
 - 6 Bird Canyon Field Infill
 - 7 Horseshoe Basin Unit
 - 8 Converse County Oil and Gas
 - 9 Riley Ridge to Natrona Pipeline
 - 10 Greater Crossbow Oil and Gas
 - 11 Desolation Road Natural Gas
 - Approved O&G Development Project**
 - 1 Pinedale Anticline
 - 2 Jonah
 - 3 Atlantic Rim
 - 4 Riley Ridge
 - Wind Energy Projects**
 - 1 Chokecherry/Sierra Madre Wind Farm
 - Helium Projects**
 - 1 Rands Butte
 - Uranium Projects**
 - 1 Sheep Mountain Uranium
 - 2 Lost Creek Uranium ISR Amendment

Date: 10/29/2015





QUESTIONS?

Thank you!

Have a great rest of your day



From: Nathan Thomas
To: [Steve Bloch](#)
Subject: Re: question about travel plan PA v5
Date: Thursday, April 21, 2016 4:36:15 PM

Okay, thanks for the input. Yesterday, Uintah County asked me to have the meeting in just the afternoon. I'll be in touch once I get back to the office or by next week.

Thanks.

Sent from my iPad

On Apr 21, 2016, at 9:54 AM, Steve Bloch <steve@suwa.org> wrote:

Thanks Nate. There's a lot going on with this latest draft of the PA. I suggest that we give ourselves as much time as possible for the May 5 meeting (maybe a working lunch?) and run it from 9-5?

Steve

From: Thomas, Nathan [<mailto:nthomas@blm.gov>]
Sent: Thursday, April 21, 2016 8:24 AM
To: Steve Bloch <steve@suwa.org>
Subject: Re: question about travel plan PA v5

Steve, it should be II. B.

Thank you.

On Wed, Apr 20, 2016 at 3:53 PM, Steve Bloch <steve@suwa.org> wrote:

Nate –

I'm looking at line 62 of the latest version which refers to Stipulation II.C.6 – which I can't seem to find. Can you help steer me to what you all intended that reference to be? Thanks.

Steve

Stephen Bloch
Attorney
Southern Utah Wilderness Alliance
425 East 100 South
Salt Lake City, Utah 84111
Phone: 801 428 3981
Fax: 801 486 4233

steve@suwa.org

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--

Nate Thomas

Deputy Preservation Officer BLM Utah

Cultural Resource Program Lead

440 West 200 South, Suite 500

PO Box 45155

Salt Lake City, Utah 84145-0155

(801) 539-4276

(435) 770-7120 Cell

From: Michael Freeman
To: "[Welch, Ruth](#)"
Cc: [Peter Hart](#); [Joel Minor](#); [Eleanor Greer](#)
Subject: Requests for State Director Review - Suspensions of Operation and Production
Date: Tuesday, April 26, 2016 6:20:37 PM
Attachments: [FINAL 2016 SG SDR petition.pdf](#)
[FINAL 2016 Ursa SDR petition.pdf](#)

Dear State Director Welch –

Attached are requests by Wilderness Workshop for state director review of two March 30, 2016 decisions issued by BLM's Colorado River Valley Field Office. The March 30 decisions extended suspensions of operations and production on 18 leases held by SG Interests, and 7 leases held by Ursa Piceance, LLC. The attached requests also are being submitted (along with attachments) by overnight delivery.

Please let us know if you have any difficulty opening the attachments to this email message, or do not receive the hard copies of these requests.

Regards,

Michael Freeman

Michael Freeman

Staff Attorney

Earthjustice Rocky Mountain Office

633 17th Street, Suite 1600

Denver, CO 80202

T: 303.996.9615

F: 303.623.8083

earthjustice.org <<http://www.earthjustice.org/>>

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April 26, 2016

Ruth Welch
Colorado State Director
Bureau of Land Management
2850 Youngfield Street
Lakewood, CO 80215-7076

**BY OVERNIGHT DELIVERY
AND ELECTRONIC MAIL**

Re: Request for State Director Review on March 30, 2016 Decision suspending operations and production on oil and gas leases: COC 66687, COC 66688, COC 66689, COC 66690, COC 66691, COC 66692, COC 66693, COC 66694, COC 66695, COC 66696, COC 66697, COC 66698, COC 66699, COC 66700, COC 66701, COC 66702, COC 66908, COC 66909.

Dear Ms. Welch:

Wilderness Workshop respectfully requests State Director review of the March 30, 2016 Decision by the Bureau of Land Management's (BLM) Colorado River Valley Field Office extending the suspension of operations and production on 18 leases held by SG Interests I, Ltd. (SG) in the Thompson Divide area of the White River National Forest (the Field Office decision). The Field Office granted the extension until a Final Environmental Impact Statement (EIS) is complete and a Record of Decision (ROD) is signed determining whether to void, reaffirm, or subject the leases to additional mitigation measures, but in no case later than April 1, 2017.

BLM has advised the public that it expects to release the Final EIS on the leases by late July, with a ROD soon thereafter. The issuance of the Final EIS and ROD may affect this Request for Review and the relief requested. For that reason, Wilderness Workshop respectfully requests that the State Director hold this Request for Review in abeyance until the Final EIS and ROD have been issued.

Wilderness Workshop is a nonprofit organization based in Carbondale, Colorado. Wilderness Workshop's mission is to protect and conserve the public lands and natural resources of the Roaring Fork Watershed, the White River National Forest (WRNF), and adjacent public lands. Wilderness Workshop is one of a number of local stakeholders working to protect the Thompson Divide from oil and gas development, including the area affected by the Field Office decision. Wilderness Workshop's members also use and enjoy the areas affected by the Field Office decision.¹

Wilderness Workshop is adversely affected by the Field Office decision, which extends the life of the 18 leases (the SG leases or WRNF leases). By preventing the leases from expiring,

¹ Wilderness Workshop, *Thompson Divide*, <http://www.wildernessworkshop.org/our-work/oil-and-gas/thompson-divide/> (last visited Apr. 26, 2016).

the Field Office decision makes it substantially likely that Wilderness Workshop's aesthetic, recreational and organizational interests will be harmed by oil and gas development in the Thompson Divide. See Three Forks Ranch Inc., 171 IBLA 323, 329 (2007); Order, Nat. Res. Def. Council, et al., IBLA 2012-272 (May 1, 2013). Enclosed on the accompanying disk are declarations from Wilderness Workshop members describing how they will be adversely affected if the SG leases are developed.

This request for review is timely filed pursuant to 43 C.F.R. § 3165.3(b).

The Field Office decision should be reversed, and SG's request for suspension should be denied for the reasons stated in Wilderness Workshop's prior filings objecting to the suspension of these leases. The new request, in fact, confirms that the leases should never have been suspended: in its request for extension of the suspensions, SG acknowledged that the company could not have brought these leases into production before they were scheduled to expire in 2013—even if BLM had not initiated its current NEPA review of the existing WRNF leases. This concession represents important new information that warrants a change in direction by BLM with regard to these suspensions.

BACKGROUND

As noted in Wilderness Workshop's previous submissions, the ten-year primary term of the SG leases was scheduled to end in 2013. Under the Mineral Leasing Act, the leases should have expired at that time, because the company had not brought them into production. 30 U.S.C. § 226(e). Nevertheless, at the request of SG, BLM granted suspension of these leases for one year on April 9, 2013. Then, on March 31, 2014, BLM extended the suspension until April 1, 2016. Wilderness Workshop submitted comments and petitions for state director review (SDR petitions) detailing the reasons BLM should have denied both of the suspension requests. We hereby incorporate those comment letters, the SDR petitions, and all attachments to the comments and petitions, by reference and submit them on the disk accompanying this request.²

Among other flaws, SG's suspension requests were based on the incorrect premise that BLM's NEPA analysis reconsidering issuance of the WRNF leases denied the company beneficial use of their leases. But as discussed in Wilderness Workshop's earlier filings, this premise is wrong: even had BLM not undertaken the current NEPA analysis, SG would not have been able to bring the leases into production before they expired. The company failed to diligently develop its leases, and could not have completed the normally-applicable permitting,

² See Letter from Michael S. Freeman, Earthjustice, to Lonny Bagley & Steve Bennett, BLM (Mar. 7, 2013) (comments on 2013 SG suspension request); Letter from Peter Hart to Ruth Welch & S. Bennett, BLM (Feb. 12, 2014) (comments on 2014 SG suspension request); Letter from M. Freeman & P. Hart to Helen Hankins, BLM (May 6, 2013) (SDR petition on 2013 SG suspensions); Letter from M. Freeman & P. Hart to R. Welch (Apr. 28, 2014) (SDR petition on 2014 SG suspensions); Letter from M. Freeman & P. Hart to Karl Mendonca and L. Bagley (Feb. 5, 2016) (comments on 2016 Requests by SG and Ursa for a Second Extension of suspensions).

surveys, and other standard requirements in time to drill wells on the leases prior to their expiration.³

On January 13, 2016, SG filed a new request for extension of the lease suspensions. Unlike the previous suspensions, which extended the leases to accommodate the NEPA review of those leases, SG asked that the leases be suspended for a much longer period. Specifically SG asked that the suspension be extended “for two complete drilling seasons after BLM has issued the WRNF Lease NEPA ROD and completed site-specific NEPA for either the unit obligation well, if BLM approves the Lake Ridge unit application, or completed site-specific NEPA on SG’s six pending APDs.” Letter from Robert H. Guinn, II, SG, to L. Bagley, et al., BLM at 4 (Jan. 13, 2016) (SG Suspension Request).

DISCUSSION

BLM should reject SG’s requests for another extension of the lease suspensions. First, the grounds discussed in Wilderness Workshop’s prior correspondence for why BLM must deny the suspension requests continue to apply. Second, SG’s new request admits that additional time is needed to drill producing wells on its leases, regardless of the ongoing NEPA review of the leases. This important concession provides an additional ground to deny the extension requests.

I. BLM SHOULD DENY THE 2016 EXTENSION REQUEST FOR THE SAME REASONS THAT IT SHOULD HAVE DENIED THE EARLIER REQUESTS.

SG has yet to meet the requirements for a suspension under the applicable statutes, regulations, IBLA precedent, or BLM manuals. See 30 U.S.C. § 209; 43 C.F.R. § 3103.4-4(a); Harvey E. Yates Co., 156 IBLA 100, 105 (2001); TNT Oil Co., 134 IBLA 201, 203 (1995); BLM Manual 3160. The company’s January 13, 2016 request largely repeats the same flawed arguments from its 2013 and 2014 requests. See, e.g., SG Suspension Request at 2 (stating that extension is justified “by the same rationale” as previous suspensions). Wilderness Workshop has already addressed these arguments in our previous comment letters and SDR petitions, and we incorporate those points by reference here:

1. The Field Office decision violates the Mineral Leasing Act, applicable regulations, and the agency’s manual. See SDR Petition on 2014 SG Suspensions at 8–9.
 - a. SG has not been denied beneficial use of its leases. See id. at 9.

³ Wilderness Workshop, along with several local governments, has appealed BLM’s prior suspension decisions to the Interior Board of Land Appeals (IBLA). IBLA dismissed the appeals for lack of standing on November 17, 2015. Bd. of Cty. Commr’s of Pitkin Cty., Colo., 186 IBLA 288, 318 (2015). That dismissal did not reach the merits of the appeal, however. See id. On January 13, 2016, Wilderness Workshop moved for reconsideration of the dismissal order, and that motion remains pending before the IBLA.

- i. The Mineral Leasing Act does not permit suspension of leases based on SG's unsuccessful unitization request. See id. at 9–12.
 - ii. BLM's decision to conduct additional NEPA analysis on the SG leases did not deny SG beneficial use of those leases. See id. at 12–22.
 - iii. River Gas Corp., 149 IBLA 239 (1999), does not authorize BLM to suspend the 12 leases for which no APDs have been filed. See id. at 22–24.
 - b. Suspending the leases does not conserve natural resources. See id. at 24–26.
2. Suspension should have been denied because leases were improperly issued. See id. at 26.
 - a. The leases are invalid because they were issued in violation of NEPA. See id. at 26–27.
 - i. BLM improperly relied on a Forest Service analysis. See id. at 27–29.
 - ii. The SG leases fell outside the scope of the Forest Service's 1993 and 2002 NEPA analyses. See id. at 29–30.
 - b. The leases are invalid because they were issued in violation of the Endangered Species Act. See id. at 30–31.
 - c. BLM issued the leases without acknowledging the requirements of the 2001 Roadless Rule. See id. at 32.
3. The Field Office violated NEPA by suspending the Lake Ridge leases. See id. at 32.
 - a. The leases cannot be suspended using a Categorical Exclusion. See id., at 32–36.

II. BLM SHOULD DENY THE 2016 EXTENSION REQUESTS BECAUSE SG HAS ACKNOWLEDGED THAT IT CANNOT BRING THE LEASES INTO PRODUCTION BEFORE THEY EXPIRE.

Remarkably, the new suspension request concedes the point Wilderness Workshop has been making since 2013: that regardless of the ongoing NEPA review, SG could not have brought the leases into production during their ten-year primary term. That admission eliminates a primary justification for the earlier suspensions.

In its January 13, 2016 extension request, SG asks for suspensions that last not only for the duration of the ongoing NEPA process, but also “provide for two complete drilling seasons

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after BLM has issued the WRNF Lease NEPA ROD and completed site-specific NEPA for either the unit obligation well, if BLM approves the Lake Ridge unit application, or completed site-specific NEPA on SG's six pending APDs." SG Suspension Request at 4. SG's request makes it clear that if the suspensions were lifted upon completion of the current NEPA process, "it would be physically impossible for SG to . . . complete a drilling program . . . on one or more of the Leases before the Lease terms expire." Id. at 3.

The company's inability to "complete a drilling program" before the leases expire, however, is due to its own failure to diligently develop the leases—not because of any denial of beneficial use by BLM. SG's admissions build on the extensive body of evidence showing that the company's inaction for the decade between 2003 and 2013 meant that it could not have brought the leases into production before they expired, and indeed never intended to do so.

SG attempts to place blame for its situation on BLM's failure to unitize the company's leases. Id. at 3. But as explained in Wilderness Workshop's previous correspondence, companies have no right to unitize their leases and BLM's decision not to grant such requests did not represent a denial of beneficial use that would support lease suspensions. Moreover, the record demonstrates that it is the leaseholder's own failure to diligently develop the leases—not BLM's refusal to unitize them—that undermines its request for suspension.

CONCLUSION

Thank you for your consideration of this request for review. Wilderness Workshop urges BLM to reverse the Field Office decision and deny the leaseholder's request for suspension of operations and production on the SG leases.

Wilderness Workshop also requests that the State Director hold this request for review in abeyance until the Final EIS and ROD regarding the WRNF leases have been issued.

Sincerely,



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jminor@earthjustice.org

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Colorado State Director
April 26, 2016
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peter@wildernessworkshop.org

Cc (by electronic mail without enclosures):

Scott Fitzwilliams
Matthew McKeown
Art Kleven
Sloan Shoemaker
Rebecca Watson

List of Exhibits (provided on disk):

1. Appendix of documents referenced in SDR Petition on 2014 SG Suspensions.
2. 1993 White River National Forest Oil and Gas Leasing Final Environmental Impact Statement and Record of Decision
3. 2002 Revision – White River National Forest Land and Resource Management Plan, with Final Environmental Impact Statement and Record of Decision
4. March 2006 Forest Plan Amendment, Management Indicator Species
5. October 2008 Southern Rockies Lynx Management Direction, Final Environmental Impact Statement and related documents
6. September 2010 Reasonably Foreseeable Development Scenario for Oil and Gas Activities for the White River National Forest
7. March 22, 2012 Bull Mountain Unit Master Development Plan - Preliminary Environmental Assessment
8. 2012 White River National Forest Oil and Gas Leasing Draft Environmental Impact Statement
9. November 30, 2012 Comments of Wilderness Workshop, et al., to White River National Forest, Forest Supervisor relating to Draft Oil and Gas Leasing Environmental Impact Statement
10. Standing Declarations by Wilderness Workshop members, submitted in Bd. of Cty. Commr's of Pitkin Cty., Colo., 186 IBLA 288, 318 (2015)
11. Letter from Michael S. Freeman, Earthjustice, to Lonny Bagley & Steve Bennett, BLM (Mar. 7, 2013)
12. Letter from Peter Hart to Ruth Welch & S. Bennett, BLM (Feb. 12, 2014)
13. Letter from M. Freeman & P. Hart to Helen Hankins, BLM (May 6, 2013)
14. Letter from M. Freeman & P. Hart to R. Welch (Apr. 28, 2014)

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Colorado State Director
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15. Letter from M. Freeman & P. Hart to Karl Mendonca and L. Bagley (Feb. 5, 2016)



April 26, 2016

Ruth Welch
Colorado State Director
Bureau of Land Management
2850 Youngfield Street
Lakewood, CO 80215-7076

**BY OVERNIGHT DELIVERY
AND ELECTRONIC MAIL**

Re: Request for State Director Review of March 30, 2016 decision suspending operations and production on oil and gas leases: COC-66706, COC-66707, COC-66708, COC-66709, COC-66710, COC-66711, and COC-66712

Dear Ms. Welch:

Wilderness Workshop respectfully requests State Director review of the March 30, 2016 Decision by the Bureau of Land Management's (BLM) Colorado River Valley Field Office extending the suspension of operations and production on 7 leases held by Ursa Piceance, LLC (Ursa) in the Thompson Divide area of the White River National Forest (the Field Office decision). The Field Office granted the extension until a Final Environmental Impact Statement (EIS) is complete and a Record of Decision (ROD) is signed determining whether to void, reaffirm, or subject the leases to additional mitigation measures, but in no case later than April 1, 2017.

BLM has advised the public that it expects to release the Final EIS on the leases by late July, with a ROD soon thereafter. The issuance of the Final EIS and ROD may affect this request for review and the relief requested. For that reason, Wilderness Workshop respectfully requests that the State Director hold this request for review in abeyance until the Final EIS and ROD have been issued.

Wilderness Workshop is a nonprofit organization based in Carbondale, Colorado. Wilderness Workshop's mission is to protect and conserve the public lands and natural resources of the Roaring Fork Watershed, the White River National Forest (WRNF), and adjacent public lands. Wilderness Workshop is one of a number of local stakeholders working to protect the Thompson Divide from oil and gas development, including the area affected by the Field Office decision. Wilderness Workshop's members also use and enjoy the areas affected by the Field Office decision.¹

Wilderness Workshop is adversely affected by the Field Office decision, which extends the life of the 7 leases (the Ursa leases or WRNF leases). By preventing the Ursa leases from expiring, the Field Office decision makes it substantially likely that Wilderness Workshop's aesthetic, recreational and organizational interests will be harmed by oil and gas development in

¹ Wilderness Workshop, *Thompson Divide*, <http://www.wildernessworkshop.org/our-work/oil-and-gas/thompson-divide/> (last visited Apr. 26, 2016).

the Thompson Divide. See Three Forks Ranch Inc., 171 IBLA 323, 329 (2007); Order, Natural Resources Defense Council, et al., IBLA 2012-272 (May 1, 2013). Enclosed on the accompanying disk are declarations from Wilderness Workshop members describing how they will be adversely affected if the Ursa leases are developed.

This request for review is timely filed pursuant to 43 C.F.R. § 3165.3(b).

The Field Office decision should be reversed, and Ursa's request for suspension should be denied for the reasons stated in Wilderness Workshop's prior filings objecting to the suspension of these leases. The new request, in fact, confirms that the leases should never have been suspended: in its request for extension of the suspensions, Ursa acknowledges that, in addition to the current NEPA review of the existing WRNF leases, the company also needs additional time for NEPA analysis on individual drilling permits. This request shows that the company could not have brought its 7 leases into production before they were scheduled to expire in 2013—even if BLM had not initiated its current NEPA review. Ursa's acknowledgment represents important new information that warrants a change in direction by BLM with regard to these suspensions.

BACKGROUND

As noted in Wilderness Workshop's previous submissions, the ten-year primary term of the Ursa leases was scheduled to end in 2013. Under the Mineral Leasing Act, the leases should have expired at that time, because the company had not brought them into production. 30 U.S.C. § 226(e). Nevertheless, at the request of Ursa, BLM granted suspension of these leases for one year on April 9, 2013. Then, on March 31, 2014, BLM extended the suspension until April 1, 2016. Wilderness Workshop submitted comments and petitions for state director review (SDR petitions) detailing the reasons BLM should have denied all of the suspension requests. We hereby incorporate those comment letters, the SDR petitions, and all attachments to the comments and petitions, by reference and submit them on the disk accompanying this request.²

Among other flaws, Ursa's suspension requests were based on the incorrect premise that BLM's NEPA analysis reconsidering issuance of the WRNF leases denied the company beneficial use of the leases. But as discussed in Wilderness Workshop's earlier filings, this premise is wrong: even had BLM not undertaken the current NEPA analysis, Ursa would not have been able to bring the leases into production before they expired. The company failed to diligently develop its leases, and could not have completed the normally-applicable permitting,

² See Letter from Peter Hart, Wilderness Workshop to Lonny Bagley & Steve Bennett (Mar. 20, 2013) (comments on 2013 Ursa suspension request); Letter from P. Hart to Ruth Welch & S. Bennett (Feb. 14, 2014) (comments on 2014 Ursa suspension request); Letter from Michael S. Freeman & P. Hart to Helen Hankins (May 6, 2013) (SDR petition on 2013 Ursa suspensions); Letter from M. Freeman & P. Hart to R. Welch (Apr. 28, 2014) (SDR petition on 2014 Ursa suspensions); Letter from M. Freeman & P. Hart to Karl Mendonca and L. Bagley (Feb. 5, 2016) (comments on 2016 Requests by SG and Ursa for a Second Extension of suspensions).

surveys, and other standard requirements in time to drill wells on the leases prior to their expiration.³

On January 14, 2016, Ursa filed a new request for extension of the lease suspensions. Unlike the previous suspensions, which extended the leases to accommodate the NEPA review of those leases, Ursa asked that the leases be suspended for a much longer period. Specifically, Ursa asked that the suspension be extended “through two additional drilling seasons beyond the date when the Leasing FEIS and individual well NEPA analyses are completed.” Letter from Don Simpson, Ursa, to L. Bagley, et al., BLM at 1–2 & n.1 (Jan. 14, 2016) (Ursa Suspension Request).

DISCUSSION

BLM should reject Ursa’s request for another extension of the lease suspensions. First, the grounds discussed in Wilderness Workshop’s prior correspondence for why BLM must deny the suspension requests continue to apply. Second, Ursa’s new request acknowledges that additional time is needed to drill producing wells on its leases, regardless of the ongoing NEPA review of the leases. This important concession provides an additional ground to deny the extension requests.

I. BLM SHOULD DENY THE 2016 EXTENSION REQUEST FOR THE SAME REASONS THAT IT SHOULD HAVE DENIED THE EARLIER REQUESTS.

Ursa has yet to meet the requirements for a suspension under the applicable statutes, regulations, IBLA precedent, or BLM manuals. See 30 U.S.C. § 209; 43 C.F.R. § 3103.4-4(a); Harvey E. Yates Co., 156 IBLA 100, 105 (2001); TNT Oil Co., 134 IBLA 201, 203 (1995); BLM Manual 3160. The company’s January 14, 2016 request largely repeats the same flawed arguments from its 2013 and 2014 requests. See, e.g., Ursa Suspension Request at 2 (stating that extension is justified “by the same rationale” as previous suspensions). Wilderness Workshop has already addressed these arguments in our previous comment letters and SDR petitions, and we incorporate those points by reference and include a bulleted list here:

1. The requirements for lease suspension have not been met. See SDR Petition on 2014 Ursa Suspensions at 11–12.
 - a. Antero and Ursa have not been denied beneficial use of the leases. See id. at 12.

³ Wilderness Workshop, along with several local governments, has appealed BLM’s prior suspension decisions to the Interior Board of Land Appeals (IBLA). IBLA dismissed the appeals for lack of standing on November 17, 2015. Bd. of Cty. Commr’s of Pitkin Cty., Colo., 186 IBLA 288, 318 (2015). That dismissal did not reach the merits of the appeal, however. See id. On January 13, 2016, Wilderness Workshop moved for reconsideration of the dismissal order, and that motion remains pending before the IBLA.

- i. The Mineral Leasing Act does not permit suspension of leases based on unsuccessful unitization requests. See id. at 12–13.
 - ii. BLM’s decision to conduct additional NEPA analysis did not deny Ursa beneficial use. See id. at 14–20.
 - iii. River Gas Corp., 149 IBLA 239 (1999), does not authorize BLM to suspend the six leases for which no APDs have been filed. See id. at 21–22.
 - b. Suspending the leases does not conserve natural resources. See id. at 22–23.
2. Suspension should have been denied because the leases were improperly issued. See id. at 23–24.
 - a. The leases are invalid because they were issued in violation of NEPA. See id. at 24.
 - i. BLM improperly relied on a Forest Service analysis. See id. at 24–26.
 - ii. The Ursa leases fell outside the scope of the Forest Service’s 1993 and 2002 NEPA analyses. See id. at 26–27.
 - b. The leases are invalid because they were issued in violation of the Endangered Species Act. See id., at 27–29.
 - c. BLM issued the leases without acknowledging the requirements of the 2001 Forest Service Roadless Rule. See id. at 29–30.
3. The Field Office violated NEPA by suspending the Ursa leases. See id. at 30.
 - a. The leases cannot be suspended using a Categorical Exclusion. See id. at 30–34.

II. BLM SHOULD DENY THE 2016 EXTENSION REQUESTS BECAUSE URSA HAS ACKNOWLEDGED THAT IT CANNOT BRING THE LEASES INTO PRODUCTION BEFORE THEY EXPIRE.

Remarkably, the new suspension request acknowledges the point Wilderness Workshop has been making since 2013: that regardless of the ongoing NEPA review, Ursa cannot bring the leases into production without an additional extension of time. That admission eliminates a primary justification for the earlier suspensions.

In its January 14, 2016 extension request, Ursa asks for suspensions that last not only for the duration of the ongoing NEPA process, but also “through two additional drilling seasons

Ms. Welch
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beyond the date when the Leasing FEIS and individual well NEPA analyses are completed.” Ursa Suspension Request at 1–2 & n.1. The request states that there is a “need for additional time to prepare . . . NEPA analyses for individual wells.” *Id.* at 4. Ursa also asserts that the additional time is “reasonable,” citing to the similar extension request filed by SG Interests. *Id.* at 2 n. 1.⁴

The company’s inability to complete a drilling program before its leases expire, however, is due to its own failure to diligently develop the leases – not because of any denial of beneficial use by BLM. Ursa’s admissions build on the extensive body of evidence showing that the company’s inactivity prior to 2013 meant that it could not have brought the seven leases into production before they expired, and indeed never intended to do so.

Ursa attempts to place blame for its situation on BLM’s failure to unitize the company’s leases. Ursa Suspension Request at 4. As explained in Wilderness Workshop’s previous correspondence, however, companies have no right to unitize their leases and BLM’s decision not to grant such requests did not represent a denial of beneficial use that would support lease suspensions. As discussed above, it is the leaseholder’s own failure to diligently develop the leases that undermines its request for suspension.

CONCLUSION

Thank you for your consideration of this request for review. Wilderness Workshop urges BLM to reverse the Field Office decision and deny the leaseholder’s request for suspension of operations and production on the Ursa leases.

Wilderness Workshop also requests that the State Director hold this request for review in abeyance until the Final EIS and ROD on the WRNF leases have been issued.

Sincerely,



⁴ SG’s request makes it clear that if the suspensions were lifted upon completion of the current NEPA process, “it would be physically impossible for SG to . . . complete a drilling program . . . on one or more of the Leases before the Lease terms expire.” Letter from Robert H. Guinn, II, SG, to L. Bagley, et al., BLM at 3 (Jan. 13, 2016).

Ms. Welch
Colorado State Director
April 26, 2016
Page 6

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Cc (by electronic mail without enclosures):

Scott Fitzwilliams
Matthew McKeown
Art Kleven
Sloan Shoemaker
Charlie Breer

List of Exhibits (provided on disk):

1. 1993 White River National Forest Oil and Gas Leasing Final Environmental Impact Statement and Record of Decision
2. 2002 Revision – White River National Forest Land and Resource Management Plan, with Final Environmental Impact Statement and Record of Decision
3. March 2006 Forest Plan Amendment, Management Indicator Species
4. October 2008 Southern Rockies Lynx Management Direction, Final Environmental Impact Statement and related documents
5. September 2010 Reasonably Foreseeable Development Scenario for Oil and Gas Activities for the White River National Forest
6. March 22, 2012 Bull Mountain Unit Master Development Plan - Preliminary Environmental Assessment
7. 2012 White River National Forest Oil and Gas Leasing Draft Environmental Impact Statement
8. November 30, 2012 Comments of Wilderness Workshop, et al., to White River National Forest, Forest Supervisor relating to Draft Oil and Gas Leasing Environmental Impact Statement
9. Standing Declarations by Wilderness Workshop members, submitted in Bd. of Cty. Commr's of Pitkin Cty., Colo., 186 IBLA 288, 318 (2015)
10. Letter from Peter Hart, Wilderness Workshop to Lonny Bagley & Steve Bennett (Mar. 20, 2013)
11. Letter from P. Hart to Ruth Welch & S. Bennett (Feb. 14, 2014)
12. Letter from Michael S. Freeman & P. Hart to Helen Hankins (May 6, 2013)
13. Letter from M. Freeman & P. Hart to R. Welch (Apr. 28, 2014)

14. Appendix of documents referenced in SDR Petition on 2014 Ursa Suspensions (specific documents included in this appendix are listed below):

- Appendix A: Ursa Piceance LLC, Request for Suspension of Operations and Production for Federal Oil and Gas Lease Nos. COC-66706; COC-66707; COC-66708; COC-66709; COC-66710; COC-66711; and COC-66712; Garfield, Mesa, and Pitkin Counties, Colorado, (February 14, 2013)
- Appendix B: John Colson, *Antero Sells Off Piceance Basin Assets*, GLENWOOD SPRINGS POST INDEPENDENT, November 6, 2012
- Appendix C: White House, *Blueprint for a Secure Energy Future* (March 30, 2011)
- Appendix D: Commission on Presidential Debates, *Transcript of Second Presidential Debate* (October 16, 2012)
- Appendix E: Colorado State University, Colorado Natural Heritage Program, 2012. *Level 4 Potential Conservation Area (PCA) Report, Middle Thompson Creek*
- Appendix F: Colorado State University, Colorado Natural Heritage Program, 2012. *Level 4 Potential Conservation Area, Willow Creek*
- Appendix G: Colorado State University, Colorado Natural Heritage Program, 2012. *Level 4 Potential Conservation Area, Fourmile Creek at Sunlight*
- Appendix H: Todd Sieber, *Geologic Evaluation Report on Application for Permit to Drill Lease COC 66708*, March 24, 2012
- Appendix I: Staff Report, *Antero to begin gas exploration project near Battlement Mesa Preliminary plan schedules drilling to start August 15*, GLENWOOD SPRINGS POST INDEPENDENT, May 28, 2009
- Appendix J: John Colson, *Battlement Mesa residents speak their piece on Antero's drilling plans*, GLENWOOD SPRINGS POST INDEPENDENT, July 9, 2009
- Appendix K: John Colson, *Antero plans increased drilling activity south of Silt; Company seeks approval for up to 850 new wells*, GLENWOOD SPRINGS POST INDEPENDENT, October 28, 2011
- Appendix L: Email from Robert Hartman, BLM, to Jennifer Robinson, CRVFO, BLM (June 05, 2012, 3:11PM)

- Appendix M: Email from Steve Ficklin, Colorado River Valley Field Office, BLM, to Peter Hart, Wilderness Workshop (June 06, 2012, 8:45AM)
- Appendix N: Email from Peter Hart, Wilderness Workshop, to Jason Gross, USFS, and Steve Ficklin, BLM (March 20, 2013, 10:14AM)
- Appendix O: Email from Jason Gross, Physical Scientist, White River National Forest, to Peter Hart, Conservation Analyst/Staff Attorney, Wilderness Workshop (April 03, 2012, 4:14PM)
- Appendix P: Email from Jason Gross, Physical Scientist, to Peter Hart, Wilderness Workshop (March 18, 2013, 9:59AM)
- Appendix Q: Scott Condon, *Gas drilling company works on keeping leases: Antero applies to create unit in Thompson Divide area out of leases that are set to expire in 2013*, GLENWOOD SPRINGS POST INDEPENDENT, August 4, 2012
- Appendix R: John Colson, *Antero Sells Off Piceance Basin Assets*, GLENWOOD SPRINGS POST INDEPENDENT, November 6, 2012
- Appendix S: Email from Peter Hart, Conservation Analyst/Staff Attorney, Wilderness Workshop, to Don Simpson, Vice President of Business Development, Ursa Resources Group, LLC (November 22, 2012, 6:58AM)
- Appendix T: Comments of Wilderness Workshop, et al. on the Lava Boulder Exploratory Development Program AND the Wolf Springs Unit (October 29, 2012)
- Appendix U: John Colson, *Ursa VP says drilling will be resumed later in 2013: Meanwhile, company will perform 'workover' on old Antero wells*, GLENWOOD SPRINGS POST INDEPENDENT, February 27, 2013
- Appendix V: Decision of Steve Bennett, Field Manager, Colorado River Valley Field Office, BLM, denying suspension requests for lease COC 58839 (In Reply Refer To: CONO40) (December 17, 2012)
- Appendix W: Decision of Steve Bennett, Field Manager, Colorado River Valley Field Office, BLM, denying suspension requests for leases COC 58836, 58837, and 58838 (In Reply Refer To: CONO40) (December 17, 2012)
- Appendix X: Email from Jason Gross, Physical Scientist, White River National Forest, to Peter Hart, Conservation Analyst/Staff Attorney, Wilderness Workshop (August 24, 2012, 1:47PM)

- Appendix Y: Alison Gallensky, GIS and IT Director, Rocky Mountain Wild, Declaration detailing method for wildlife and wildland screening (March 18, 2013)
- Appendix Z: Rocky Mountain Wild, Wildlife and wildland screen for the Ursa leases (2013)
- Appendix AA: Lea Linse, *Students offered chance to question the gas industry*, GLENWOOD SPRINGS POST INDEPENDENT (June 5, 2011)
- Appendix BB: Karen Zurek, Chief Fluid Minerals Adjudication, Colorado State Office, BLM, August 12, 2009 Decision withdrawing leases, declaring leases invalid ab initio, and authorizing refunds to Encana
- Appendix CC: High Country Citizens' Alliance et al. Protest of Colorado BLM's August 10, 2006 Lease Sale
- Appendix DD: Map depicting lynx habitat and Thompson Divide leases
- Appendix EE: Map depicting leases and inventoried roadless areas within the Thompson Divide
- Appendix FF: SG Interests VII, LTD, Request for Suspension of and Production for leases in the Thompson Divide (February 13, 2013)
- Appendix GG: Wilderness Workshop et al. comments on the WRNF DEIS (Nov. 30, 2012)
- Appendix HH: Wilderness Workshop comments on Ursa Piceance LLC's January 17, 2014 Request for Extension of Suspension of Operations for Federal Oil and Gas Lease Nos. COC-66706; COC-66707; COC-66708; COC-66709; COC-66710; COC-66711; and COC-66712 (with Attachments) (Feb. 14, 2014)
- Appendix II: Decision of Lonny R. Bagley, Deputy State Director, Division of Energy, Lands and Minerals, Colorado State Office, BLM, upholding the denial of suspension requests for leases COC 65622 (March 19, 2012)
- Appendix JJ: Declaration of Eric R. Wahl, resident of Garfield County and member of Wilderness Workshop (April 18, 2014)
- Appendix KK: Notice of Proposed Action from Scott G. Fitzwilliams, Forest Supervisor, White River National Forest, for preparation of an Environmental

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Assessment of the Lava Boulder Creek Exploratory Development Program
(October 1, 2012)

From: Michael Freeman
To: ["sfitzwilliams@fs.fed.us"](mailto:sfitzwilliams@fs.fed.us); matthew.mckeown@sol.doi.gov; "Kleven, Art"; [Charlie Breer \(Charlie@THlawgroup.com\)](mailto:Charlie.Breer@THlawgroup.com); "Rebecca Watson"; kmendonc@blm.gov
Cc: [Peter Hart](mailto:Peter.Hart); [Joel Minor](mailto:Joel.Minor); [Sloan Shoemaker](mailto:Sloan.Shoemaker)
Subject: FW: Requests for State Director Review - Suspensions of Operation and Production
Date: Tuesday, April 26, 2016 6:29:22 PM
Attachments: [FINAL 2016 SG SDR petition.pdf](#)
[FINAL 2016 Ursa SDR petition.pdf](#)

Attached please find requests for state director review regarding the recent suspensions of SG and Ursa's leases.

Regards,

Mike Freeman

From: Michael Freeman
Sent: Tuesday, April 26, 2016 4:16 PM
To: 'Welch, Ruth'
Cc: Peter Hart; Joel Minor; Eleanor Greer
Subject: Requests for State Director Review - Suspensions of Operation and Production

Dear State Director Welch –

Attached are requests by Wilderness Workshop for state director review of two March 30, 2016 decisions issued by BLM's Colorado River Valley Field Office. The March 30 decisions extended suspensions of operations and production on 18 leases held by SG Interests, and 7 leases held by Ursa Piceance, LLC. The attached requests also are being submitted (along with attachments) by overnight delivery.

Please let us know if you have any difficulty opening the attachments to this email message, or do not receive the hard copies of these requests.

Regards,

Michael Freeman

Michael Freeman

Staff Attorney

Earthjustice Rocky Mountain Office

633 17th Street, Suite 1600

Denver, CO 80202

T: 303.996.9615

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earthjustice.org <<http://www.earthjustice.org/>>

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April 26, 2016

Ruth Welch
Colorado State Director
Bureau of Land Management
2850 Youngfield Street
Lakewood, CO 80215-7076

**BY OVERNIGHT DELIVERY
AND ELECTRONIC MAIL**

Re: Request for State Director Review on March 30, 2016 Decision suspending operations and production on oil and gas leases: COC 66687, COC 66688, COC 66689, COC 66690, COC 66691, COC 66692, COC 66693, COC 66694, COC 66695, COC 66696, COC 66697, COC 66698, COC 66699, COC 66700, COC 66701, COC 66702, COC 66908, COC 66909.

Dear Ms. Welch:

Wilderness Workshop respectfully requests State Director review of the March 30, 2016 Decision by the Bureau of Land Management's (BLM) Colorado River Valley Field Office extending the suspension of operations and production on 18 leases held by SG Interests I, Ltd. (SG) in the Thompson Divide area of the White River National Forest (the Field Office decision). The Field Office granted the extension until a Final Environmental Impact Statement (EIS) is complete and a Record of Decision (ROD) is signed determining whether to void, reaffirm, or subject the leases to additional mitigation measures, but in no case later than April 1, 2017.

BLM has advised the public that it expects to release the Final EIS on the leases by late July, with a ROD soon thereafter. The issuance of the Final EIS and ROD may affect this Request for Review and the relief requested. For that reason, Wilderness Workshop respectfully requests that the State Director hold this Request for Review in abeyance until the Final EIS and ROD have been issued.

Wilderness Workshop is a nonprofit organization based in Carbondale, Colorado. Wilderness Workshop's mission is to protect and conserve the public lands and natural resources of the Roaring Fork Watershed, the White River National Forest (WRNF), and adjacent public lands. Wilderness Workshop is one of a number of local stakeholders working to protect the Thompson Divide from oil and gas development, including the area affected by the Field Office decision. Wilderness Workshop's members also use and enjoy the areas affected by the Field Office decision.¹

Wilderness Workshop is adversely affected by the Field Office decision, which extends the life of the 18 leases (the SG leases or WRNF leases). By preventing the leases from expiring,

¹ Wilderness Workshop, *Thompson Divide*, <http://www.wildernessworkshop.org/our-work/oil-and-gas/thompson-divide/> (last visited Apr. 26, 2016).

the Field Office decision makes it substantially likely that Wilderness Workshop's aesthetic, recreational and organizational interests will be harmed by oil and gas development in the Thompson Divide. See Three Forks Ranch Inc., 171 IBLA 323, 329 (2007); Order, Nat. Res. Def. Council, et al., IBLA 2012-272 (May 1, 2013). Enclosed on the accompanying disk are declarations from Wilderness Workshop members describing how they will be adversely affected if the SG leases are developed.

This request for review is timely filed pursuant to 43 C.F.R. § 3165.3(b).

The Field Office decision should be reversed, and SG's request for suspension should be denied for the reasons stated in Wilderness Workshop's prior filings objecting to the suspension of these leases. The new request, in fact, confirms that the leases should never have been suspended: in its request for extension of the suspensions, SG acknowledged that the company could not have brought these leases into production before they were scheduled to expire in 2013—even if BLM had not initiated its current NEPA review of the existing WRNF leases. This concession represents important new information that warrants a change in direction by BLM with regard to these suspensions.

BACKGROUND

As noted in Wilderness Workshop's previous submissions, the ten-year primary term of the SG leases was scheduled to end in 2013. Under the Mineral Leasing Act, the leases should have expired at that time, because the company had not brought them into production. 30 U.S.C. § 226(e). Nevertheless, at the request of SG, BLM granted suspension of these leases for one year on April 9, 2013. Then, on March 31, 2014, BLM extended the suspension until April 1, 2016. Wilderness Workshop submitted comments and petitions for state director review (SDR petitions) detailing the reasons BLM should have denied both of the suspension requests. We hereby incorporate those comment letters, the SDR petitions, and all attachments to the comments and petitions, by reference and submit them on the disk accompanying this request.²

Among other flaws, SG's suspension requests were based on the incorrect premise that BLM's NEPA analysis reconsidering issuance of the WRNF leases denied the company beneficial use of their leases. But as discussed in Wilderness Workshop's earlier filings, this premise is wrong: even had BLM not undertaken the current NEPA analysis, SG would not have been able to bring the leases into production before they expired. The company failed to diligently develop its leases, and could not have completed the normally-applicable permitting,

² See Letter from Michael S. Freeman, Earthjustice, to Lonny Bagley & Steve Bennett, BLM (Mar. 7, 2013) (comments on 2013 SG suspension request); Letter from Peter Hart to Ruth Welch & S. Bennett, BLM (Feb. 12, 2014) (comments on 2014 SG suspension request); Letter from M. Freeman & P. Hart to Helen Hankins, BLM (May 6, 2013) (SDR petition on 2013 SG suspensions); Letter from M. Freeman & P. Hart to R. Welch (Apr. 28, 2014) (SDR petition on 2014 SG suspensions); Letter from M. Freeman & P. Hart to Karl Mendonca and L. Bagley (Feb. 5, 2016) (comments on 2016 Requests by SG and Ursa for a Second Extension of suspensions).

surveys, and other standard requirements in time to drill wells on the leases prior to their expiration.³

On January 13, 2016, SG filed a new request for extension of the lease suspensions. Unlike the previous suspensions, which extended the leases to accommodate the NEPA review of those leases, SG asked that the leases be suspended for a much longer period. Specifically SG asked that the suspension be extended “for two complete drilling seasons after BLM has issued the WRNF Lease NEPA ROD and completed site-specific NEPA for either the unit obligation well, if BLM approves the Lake Ridge unit application, or completed site-specific NEPA on SG’s six pending APDs.” Letter from Robert H. Guinn, II, SG, to L. Bagley, et al., BLM at 4 (Jan. 13, 2016) (SG Suspension Request).

DISCUSSION

BLM should reject SG’s requests for another extension of the lease suspensions. First, the grounds discussed in Wilderness Workshop’s prior correspondence for why BLM must deny the suspension requests continue to apply. Second, SG’s new request admits that additional time is needed to drill producing wells on its leases, regardless of the ongoing NEPA review of the leases. This important concession provides an additional ground to deny the extension requests.

I. BLM SHOULD DENY THE 2016 EXTENSION REQUEST FOR THE SAME REASONS THAT IT SHOULD HAVE DENIED THE EARLIER REQUESTS.

SG has yet to meet the requirements for a suspension under the applicable statutes, regulations, IBLA precedent, or BLM manuals. See 30 U.S.C. § 209; 43 C.F.R. § 3103.4-4(a); Harvey E. Yates Co., 156 IBLA 100, 105 (2001); TNT Oil Co., 134 IBLA 201, 203 (1995); BLM Manual 3160. The company’s January 13, 2016 request largely repeats the same flawed arguments from its 2013 and 2014 requests. See, e.g., SG Suspension Request at 2 (stating that extension is justified “by the same rationale” as previous suspensions). Wilderness Workshop has already addressed these arguments in our previous comment letters and SDR petitions, and we incorporate those points by reference here:

1. The Field Office decision violates the Mineral Leasing Act, applicable regulations, and the agency’s manual. See SDR Petition on 2014 SG Suspensions at 8–9.
 - a. SG has not been denied beneficial use of its leases. See id. at 9.

³ Wilderness Workshop, along with several local governments, has appealed BLM’s prior suspension decisions to the Interior Board of Land Appeals (IBLA). IBLA dismissed the appeals for lack of standing on November 17, 2015. Bd. of Cty. Commr’s of Pitkin Cty., Colo., 186 IBLA 288, 318 (2015). That dismissal did not reach the merits of the appeal, however. See id. On January 13, 2016, Wilderness Workshop moved for reconsideration of the dismissal order, and that motion remains pending before the IBLA.

- i. The Mineral Leasing Act does not permit suspension of leases based on SG's unsuccessful unitization request. See id. at 9–12.
 - ii. BLM's decision to conduct additional NEPA analysis on the SG leases did not deny SG beneficial use of those leases. See id. at 12–22.
 - iii. River Gas Corp., 149 IBLA 239 (1999), does not authorize BLM to suspend the 12 leases for which no APDs have been filed. See id. at 22–24.
 - b. Suspending the leases does not conserve natural resources. See id. at 24–26.
2. Suspension should have been denied because leases were improperly issued. See id. at 26.
 - a. The leases are invalid because they were issued in violation of NEPA. See id. at 26–27.
 - i. BLM improperly relied on a Forest Service analysis. See id. at 27–29.
 - ii. The SG leases fell outside the scope of the Forest Service's 1993 and 2002 NEPA analyses. See id. at 29–30.
 - b. The leases are invalid because they were issued in violation of the Endangered Species Act. See id. at 30–31.
 - c. BLM issued the leases without acknowledging the requirements of the 2001 Roadless Rule. See id. at 32.
3. The Field Office violated NEPA by suspending the Lake Ridge leases. See id. at 32.
 - a. The leases cannot be suspended using a Categorical Exclusion. See id., at 32–36.

II. BLM SHOULD DENY THE 2016 EXTENSION REQUESTS BECAUSE SG HAS ACKNOWLEDGED THAT IT CANNOT BRING THE LEASES INTO PRODUCTION BEFORE THEY EXPIRE.

Remarkably, the new suspension request concedes the point Wilderness Workshop has been making since 2013: that regardless of the ongoing NEPA review, SG could not have brought the leases into production during their ten-year primary term. That admission eliminates a primary justification for the earlier suspensions.

In its January 13, 2016 extension request, SG asks for suspensions that last not only for the duration of the ongoing NEPA process, but also “provide for two complete drilling seasons

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after BLM has issued the WRNF Lease NEPA ROD and completed site-specific NEPA for either the unit obligation well, if BLM approves the Lake Ridge unit application, or completed site-specific NEPA on SG's six pending APDs." SG Suspension Request at 4. SG's request makes it clear that if the suspensions were lifted upon completion of the current NEPA process, "it would be physically impossible for SG to . . . complete a drilling program . . . on one or more of the Leases before the Lease terms expire." Id. at 3.

The company's inability to "complete a drilling program" before the leases expire, however, is due to its own failure to diligently develop the leases—not because of any denial of beneficial use by BLM. SG's admissions build on the extensive body of evidence showing that the company's inaction for the decade between 2003 and 2013 meant that it could not have brought the leases into production before they expired, and indeed never intended to do so.

SG attempts to place blame for its situation on BLM's failure to unitize the company's leases. Id. at 3. But as explained in Wilderness Workshop's previous correspondence, companies have no right to unitize their leases and BLM's decision not to grant such requests did not represent a denial of beneficial use that would support lease suspensions. Moreover, the record demonstrates that it is the leaseholder's own failure to diligently develop the leases—not BLM's refusal to unitize them—that undermines its request for suspension.

CONCLUSION

Thank you for your consideration of this request for review. Wilderness Workshop urges BLM to reverse the Field Office decision and deny the leaseholder's request for suspension of operations and production on the SG leases.

Wilderness Workshop also requests that the State Director hold this request for review in abeyance until the Final EIS and ROD regarding the WRNF leases have been issued.

Sincerely,



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Ms. Welch
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April 26, 2016
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Peter Hart
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peter@wildernessworkshop.org

Cc (by electronic mail without enclosures):

Scott Fitzwilliams
Matthew McKeown
Art Kleven
Sloan Shoemaker
Rebecca Watson

List of Exhibits (provided on disk):

1. Appendix of documents referenced in SDR Petition on 2014 SG Suspensions.
2. 1993 White River National Forest Oil and Gas Leasing Final Environmental Impact Statement and Record of Decision
3. 2002 Revision – White River National Forest Land and Resource Management Plan, with Final Environmental Impact Statement and Record of Decision
4. March 2006 Forest Plan Amendment, Management Indicator Species
5. October 2008 Southern Rockies Lynx Management Direction, Final Environmental Impact Statement and related documents
6. September 2010 Reasonably Foreseeable Development Scenario for Oil and Gas Activities for the White River National Forest
7. March 22, 2012 Bull Mountain Unit Master Development Plan - Preliminary Environmental Assessment
8. 2012 White River National Forest Oil and Gas Leasing Draft Environmental Impact Statement
9. November 30, 2012 Comments of Wilderness Workshop, et al., to White River National Forest, Forest Supervisor relating to Draft Oil and Gas Leasing Environmental Impact Statement
10. Standing Declarations by Wilderness Workshop members, submitted in Bd. of Cty. Commr's of Pitkin Cty., Colo., 186 IBLA 288, 318 (2015)
11. Letter from Michael S. Freeman, Earthjustice, to Lonny Bagley & Steve Bennett, BLM (Mar. 7, 2013)
12. Letter from Peter Hart to Ruth Welch & S. Bennett, BLM (Feb. 12, 2014)
13. Letter from M. Freeman & P. Hart to Helen Hankins, BLM (May 6, 2013)
14. Letter from M. Freeman & P. Hart to R. Welch (Apr. 28, 2014)

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15. Letter from M. Freeman & P. Hart to Karl Mendonca and L. Bagley (Feb. 5, 2016)



April 26, 2016

Ruth Welch
Colorado State Director
Bureau of Land Management
2850 Youngfield Street
Lakewood, CO 80215-7076

**BY OVERNIGHT DELIVERY
AND ELECTRONIC MAIL**

Re: Request for State Director Review of March 30, 2016 decision suspending operations and production on oil and gas leases: COC-66706, COC-66707, COC-66708, COC-66709, COC-66710, COC-66711, and COC-66712

Dear Ms. Welch:

Wilderness Workshop respectfully requests State Director review of the March 30, 2016 Decision by the Bureau of Land Management's (BLM) Colorado River Valley Field Office extending the suspension of operations and production on 7 leases held by Ursa Piceance, LLC (Ursa) in the Thompson Divide area of the White River National Forest (the Field Office decision). The Field Office granted the extension until a Final Environmental Impact Statement (EIS) is complete and a Record of Decision (ROD) is signed determining whether to void, reaffirm, or subject the leases to additional mitigation measures, but in no case later than April 1, 2017.

BLM has advised the public that it expects to release the Final EIS on the leases by late July, with a ROD soon thereafter. The issuance of the Final EIS and ROD may affect this request for review and the relief requested. For that reason, Wilderness Workshop respectfully requests that the State Director hold this request for review in abeyance until the Final EIS and ROD have been issued.

Wilderness Workshop is a nonprofit organization based in Carbondale, Colorado. Wilderness Workshop's mission is to protect and conserve the public lands and natural resources of the Roaring Fork Watershed, the White River National Forest (WRNF), and adjacent public lands. Wilderness Workshop is one of a number of local stakeholders working to protect the Thompson Divide from oil and gas development, including the area affected by the Field Office decision. Wilderness Workshop's members also use and enjoy the areas affected by the Field Office decision.¹

Wilderness Workshop is adversely affected by the Field Office decision, which extends the life of the 7 leases (the Ursa leases or WRNF leases). By preventing the Ursa leases from expiring, the Field Office decision makes it substantially likely that Wilderness Workshop's aesthetic, recreational and organizational interests will be harmed by oil and gas development in

¹ Wilderness Workshop, *Thompson Divide*, <http://www.wildernessworkshop.org/our-work/oil-and-gas/thompson-divide/> (last visited Apr. 26, 2016).

the Thompson Divide. See Three Forks Ranch Inc., 171 IBLA 323, 329 (2007); Order, Natural Resources Defense Council, et al., IBLA 2012-272 (May 1, 2013). Enclosed on the accompanying disk are declarations from Wilderness Workshop members describing how they will be adversely affected if the Ursa leases are developed.

This request for review is timely filed pursuant to 43 C.F.R. § 3165.3(b).

The Field Office decision should be reversed, and Ursa's request for suspension should be denied for the reasons stated in Wilderness Workshop's prior filings objecting to the suspension of these leases. The new request, in fact, confirms that the leases should never have been suspended: in its request for extension of the suspensions, Ursa acknowledges that, in addition to the current NEPA review of the existing WRNF leases, the company also needs additional time for NEPA analysis on individual drilling permits. This request shows that the company could not have brought its 7 leases into production before they were scheduled to expire in 2013—even if BLM had not initiated its current NEPA review. Ursa's acknowledgment represents important new information that warrants a change in direction by BLM with regard to these suspensions.

BACKGROUND

As noted in Wilderness Workshop's previous submissions, the ten-year primary term of the Ursa leases was scheduled to end in 2013. Under the Mineral Leasing Act, the leases should have expired at that time, because the company had not brought them into production. 30 U.S.C. § 226(e). Nevertheless, at the request of Ursa, BLM granted suspension of these leases for one year on April 9, 2013. Then, on March 31, 2014, BLM extended the suspension until April 1, 2016. Wilderness Workshop submitted comments and petitions for state director review (SDR petitions) detailing the reasons BLM should have denied all of the suspension requests. We hereby incorporate those comment letters, the SDR petitions, and all attachments to the comments and petitions, by reference and submit them on the disk accompanying this request.²

Among other flaws, Ursa's suspension requests were based on the incorrect premise that BLM's NEPA analysis reconsidering issuance of the WRNF leases denied the company beneficial use of the leases. But as discussed in Wilderness Workshop's earlier filings, this premise is wrong: even had BLM not undertaken the current NEPA analysis, Ursa would not have been able to bring the leases into production before they expired. The company failed to diligently develop its leases, and could not have completed the normally-applicable permitting,

² See Letter from Peter Hart, Wilderness Workshop to Lonny Bagley & Steve Bennett (Mar. 20, 2013) (comments on 2013 Ursa suspension request); Letter from P. Hart to Ruth Welch & S. Bennett (Feb. 14, 2014) (comments on 2014 Ursa suspension request); Letter from Michael S. Freeman & P. Hart to Helen Hankins (May 6, 2013) (SDR petition on 2013 Ursa suspensions); Letter from M. Freeman & P. Hart to R. Welch (Apr. 28, 2014) (SDR petition on 2014 Ursa suspensions); Letter from M. Freeman & P. Hart to Karl Mendonca and L. Bagley (Feb. 5, 2016) (comments on 2016 Requests by SG and Ursa for a Second Extension of suspensions).

surveys, and other standard requirements in time to drill wells on the leases prior to their expiration.³

On January 14, 2016, Ursa filed a new request for extension of the lease suspensions. Unlike the previous suspensions, which extended the leases to accommodate the NEPA review of those leases, Ursa asked that the leases be suspended for a much longer period. Specifically, Ursa asked that the suspension be extended “through two additional drilling seasons beyond the date when the Leasing FEIS and individual well NEPA analyses are completed.” Letter from Don Simpson, Ursa, to L. Bagley, et al., BLM at 1–2 & n.1 (Jan. 14, 2016) (Ursa Suspension Request).

DISCUSSION

BLM should reject Ursa’s request for another extension of the lease suspensions. First, the grounds discussed in Wilderness Workshop’s prior correspondence for why BLM must deny the suspension requests continue to apply. Second, Ursa’s new request acknowledges that additional time is needed to drill producing wells on its leases, regardless of the ongoing NEPA review of the leases. This important concession provides an additional ground to deny the extension requests.

I. BLM SHOULD DENY THE 2016 EXTENSION REQUEST FOR THE SAME REASONS THAT IT SHOULD HAVE DENIED THE EARLIER REQUESTS.

Ursa has yet to meet the requirements for a suspension under the applicable statutes, regulations, IBLA precedent, or BLM manuals. See 30 U.S.C. § 209; 43 C.F.R. § 3103.4-4(a); Harvey E. Yates Co., 156 IBLA 100, 105 (2001); TNT Oil Co., 134 IBLA 201, 203 (1995); BLM Manual 3160. The company’s January 14, 2016 request largely repeats the same flawed arguments from its 2013 and 2014 requests. See, e.g., Ursa Suspension Request at 2 (stating that extension is justified “by the same rationale” as previous suspensions). Wilderness Workshop has already addressed these arguments in our previous comment letters and SDR petitions, and we incorporate those points by reference and include a bulleted list here:

1. The requirements for lease suspension have not been met. See SDR Petition on 2014 Ursa Suspensions at 11–12.
 - a. Antero and Ursa have not been denied beneficial use of the leases. See id. at 12.

³ Wilderness Workshop, along with several local governments, has appealed BLM’s prior suspension decisions to the Interior Board of Land Appeals (IBLA). IBLA dismissed the appeals for lack of standing on November 17, 2015. Bd. of Cty. Commr’s of Pitkin Cty., Colo., 186 IBLA 288, 318 (2015). That dismissal did not reach the merits of the appeal, however. See id. On January 13, 2016, Wilderness Workshop moved for reconsideration of the dismissal order, and that motion remains pending before the IBLA.

- i. The Mineral Leasing Act does not permit suspension of leases based on unsuccessful unitization requests. See id. at 12–13.
 - ii. BLM’s decision to conduct additional NEPA analysis did not deny Ursa beneficial use. See id. at 14–20.
 - iii. River Gas Corp., 149 IBLA 239 (1999), does not authorize BLM to suspend the six leases for which no APDs have been filed. See id. at 21–22.
 - b. Suspending the leases does not conserve natural resources. See id. at 22–23.
2. Suspension should have been denied because the leases were improperly issued. See id. at 23–24.
 - a. The leases are invalid because they were issued in violation of NEPA. See id. at 24.
 - i. BLM improperly relied on a Forest Service analysis. See id. at 24–26.
 - ii. The Ursa leases fell outside the scope of the Forest Service’s 1993 and 2002 NEPA analyses. See id. at 26–27.
 - b. The leases are invalid because they were issued in violation of the Endangered Species Act. See id., at 27–29.
 - c. BLM issued the leases without acknowledging the requirements of the 2001 Forest Service Roadless Rule. See id. at 29–30.
3. The Field Office violated NEPA by suspending the Ursa leases. See id. at 30.
 - a. The leases cannot be suspended using a Categorical Exclusion. See id. at 30–34.

II. BLM SHOULD DENY THE 2016 EXTENSION REQUESTS BECAUSE URSA HAS ACKNOWLEDGED THAT IT CANNOT BRING THE LEASES INTO PRODUCTION BEFORE THEY EXPIRE.

Remarkably, the new suspension request acknowledges the point Wilderness Workshop has been making since 2013: that regardless of the ongoing NEPA review, Ursa cannot bring the leases into production without an additional extension of time. That admission eliminates a primary justification for the earlier suspensions.

In its January 14, 2016 extension request, Ursa asks for suspensions that last not only for the duration of the ongoing NEPA process, but also “through two additional drilling seasons

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beyond the date when the Leasing FEIS and individual well NEPA analyses are completed.” Ursa Suspension Request at 1–2 & n.1. The request states that there is a “need for additional time to prepare . . . NEPA analyses for individual wells.” *Id.* at 4. Ursa also asserts that the additional time is “reasonable,” citing to the similar extension request filed by SG Interests. *Id.* at 2 n. 1.⁴

The company’s inability to complete a drilling program before its leases expire, however, is due to its own failure to diligently develop the leases – not because of any denial of beneficial use by BLM. Ursa’s admissions build on the extensive body of evidence showing that the company’s inactivity prior to 2013 meant that it could not have brought the seven leases into production before they expired, and indeed never intended to do so.

Ursa attempts to place blame for its situation on BLM’s failure to unitize the company’s leases. Ursa Suspension Request at 4. As explained in Wilderness Workshop’s previous correspondence, however, companies have no right to unitize their leases and BLM’s decision not to grant such requests did not represent a denial of beneficial use that would support lease suspensions. As discussed above, it is the leaseholder’s own failure to diligently develop the leases that undermines its request for suspension.

CONCLUSION

Thank you for your consideration of this request for review. Wilderness Workshop urges BLM to reverse the Field Office decision and deny the leaseholder’s request for suspension of operations and production on the Ursa leases.

Wilderness Workshop also requests that the State Director hold this request for review in abeyance until the Final EIS and ROD on the WRNF leases have been issued.

Sincerely,



⁴ SG’s request makes it clear that if the suspensions were lifted upon completion of the current NEPA process, “it would be physically impossible for SG to . . . complete a drilling program . . . on one or more of the Leases before the Lease terms expire.” Letter from Robert H. Guinn, II, SG, to L. Bagley, et al., BLM at 3 (Jan. 13, 2016).

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Cc (by electronic mail without enclosures):

Scott Fitzwilliams
Matthew McKeown
Art Kleven
Sloan Shoemaker
Charlie Breer

List of Exhibits (provided on disk):

1. 1993 White River National Forest Oil and Gas Leasing Final Environmental Impact Statement and Record of Decision
2. 2002 Revision – White River National Forest Land and Resource Management Plan, with Final Environmental Impact Statement and Record of Decision
3. March 2006 Forest Plan Amendment, Management Indicator Species
4. October 2008 Southern Rockies Lynx Management Direction, Final Environmental Impact Statement and related documents
5. September 2010 Reasonably Foreseeable Development Scenario for Oil and Gas Activities for the White River National Forest
6. March 22, 2012 Bull Mountain Unit Master Development Plan - Preliminary Environmental Assessment
7. 2012 White River National Forest Oil and Gas Leasing Draft Environmental Impact Statement
8. November 30, 2012 Comments of Wilderness Workshop, et al., to White River National Forest, Forest Supervisor relating to Draft Oil and Gas Leasing Environmental Impact Statement
9. Standing Declarations by Wilderness Workshop members, submitted in Bd. of Cty. Commr's of Pitkin Cty., Colo., 186 IBLA 288, 318 (2015)
10. Letter from Peter Hart, Wilderness Workshop to Lonny Bagley & Steve Bennett (Mar. 20, 2013)
11. Letter from P. Hart to Ruth Welch & S. Bennett (Feb. 14, 2014)
12. Letter from Michael S. Freeman & P. Hart to Helen Hankins (May 6, 2013)
13. Letter from M. Freeman & P. Hart to R. Welch (Apr. 28, 2014)

14. Appendix of documents referenced in SDR Petition on 2014 Ursa Suspensions (specific documents included in this appendix are listed below):

- Appendix A: Ursa Piceance LLC, Request for Suspension of Operations and Production for Federal Oil and Gas Lease Nos. COC-66706; COC-66707; COC-66708; COC-66709; COC-66710; COC-66711; and COC-66712; Garfield, Mesa, and Pitkin Counties, Colorado, (February 14, 2013)
- Appendix B: John Colson, *Antero Sells Off Piceance Basin Assets*, GLENWOOD SPRINGS POST INDEPENDENT, November 6, 2012
- Appendix C: White House, *Blueprint for a Secure Energy Future* (March 30, 2011)
- Appendix D: Commission on Presidential Debates, *Transcript of Second Presidential Debate* (October 16, 2012)
- Appendix E: Colorado State University, Colorado Natural Heritage Program, 2012. Level 4 Potential Conservation Area (PCA) Report, Middle Thompson Creek
- Appendix F: Colorado State University, Colorado Natural Heritage Program, 2012. Level 4 Potential Conservation Area, Willow Creek
- Appendix G: Colorado State University, Colorado Natural Heritage Program, 2012. Level 4 Potential Conservation Area, Fourmile Creek at Sunlight
- Appendix H: Todd Sieber, *Geologic Evaluation Report on Application for Permit to Drill Lease COC 66708*, March 24, 2012
- Appendix I: Staff Report, *Antero to begin gas exploration project near Battlement Mesa Preliminary plan schedules drilling to start August 15*, GLENWOOD SPRINGS POST INDEPENDENT, May 28, 2009
- Appendix J: John Colson, *Battlement Mesa residents speak their piece on Antero's drilling plans*, GLENWOOD SPRINGS POST INDEPENDENT, July 9, 2009
- Appendix K: John Colson, *Antero plans increased drilling activity south of Silt; Company seeks approval for up to 850 new wells*, GLENWOOD SPRINGS POST INDEPENDENT, October 28, 2011
- Appendix L: Email from Robert Hartman, BLM, to Jennifer Robinson, CRVFO, BLM (June 05, 2012, 3:11PM)

- Appendix M: Email from Steve Ficklin, Colorado River Valley Field Office, BLM, to Peter Hart, Wilderness Workshop (June 06, 2012, 8:45AM)
- Appendix N: Email from Peter Hart, Wilderness Workshop, to Jason Gross, USFS, and Steve Ficklin, BLM (March 20, 2013, 10:14AM)
- Appendix O: Email from Jason Gross, Physical Scientist, White River National Forest, to Peter Hart, Conservation Analyst/Staff Attorney, Wilderness Workshop (April 03, 2012, 4:14PM)
- Appendix P: Email from Jason Gross, Physical Scientist, to Peter Hart, Wilderness Workshop (March 18, 2013, 9:59AM)
- Appendix Q: Scott Condon, *Gas drilling company works on keeping leases: Antero applies to create unit in Thompson Divide area out of leases that are set to expire in 2013*, GLENWOOD SPRINGS POST INDEPENDENT, August 4, 2012
- Appendix R: John Colson, *Antero Sells Off Piceance Basin Assets*, GLENWOOD SPRINGS POST INDEPENDENT, November 6, 2012
- Appendix S: Email from Peter Hart, Conservation Analyst/Staff Attorney, Wilderness Workshop, to Don Simpson, Vice President of Business Development, Ursa Resources Group, LLC (November 22, 2012, 6:58AM)
- Appendix T: Comments of Wilderness Workshop, et al. on the Lava Boulder Exploratory Development Program AND the Wolf Springs Unit (October 29, 2012)
- Appendix U: John Colson, *Ursa VP says drilling will be resumed later in 2013: Meanwhile, company will perform 'workover' on old Antero wells*, GLENWOOD SPRINGS POST INDEPENDENT, February 27, 2013
- Appendix V: Decision of Steve Bennett, Field Manager, Colorado River Valley Field Office, BLM, denying suspension requests for lease COC 58839 (In Reply Refer To: CONO40) (December 17, 2012)
- Appendix W: Decision of Steve Bennett, Field Manager, Colorado River Valley Field Office, BLM, denying suspension requests for leases COC 58836, 58837, and 58838 (In Reply Refer To: CONO40) (December 17, 2012)
- Appendix X: Email from Jason Gross, Physical Scientist, White River National Forest, to Peter Hart, Conservation Analyst/Staff Attorney, Wilderness Workshop (August 24, 2012, 1:47PM)

- Appendix Y: Alison Gallensky, GIS and IT Director, Rocky Mountain Wild, Declaration detailing method for wildlife and wildland screening (March 18, 2013)
- Appendix Z: Rocky Mountain Wild, Wildlife and wildland screen for the Ursa leases (2013)
- Appendix AA: Lea Linse, *Students offered chance to question the gas industry*, GLENWOOD SPRINGS POST INDEPENDENT (June 5, 2011)
- Appendix BB: Karen Zurek, Chief Fluid Minerals Adjudication, Colorado State Office, BLM, August 12, 2009 Decision withdrawing leases, declaring leases invalid ab initio, and authorizing refunds to Encana
- Appendix CC: High Country Citizens' Alliance et al. Protest of Colorado BLM's August 10, 2006 Lease Sale
- Appendix DD: Map depicting lynx habitat and Thompson Divide leases
- Appendix EE: Map depicting leases and inventoried roadless areas within the Thompson Divide
- Appendix FF: SG Interests VII, LTD, Request for Suspension of and Production for leases in the Thompson Divide (February 13, 2013)
- Appendix GG: Wilderness Workshop et al. comments on the WRNF DEIS (Nov. 30, 2012)
- Appendix HH: Wilderness Workshop comments on Ursa Piceance LLC's January 17, 2014 Request for Extension of Suspension of Operations for Federal Oil and Gas Lease Nos. COC-66706; COC-66707; COC-66708; COC-66709; COC-66710; COC-66711; and COC-66712 (with Attachments) (Feb. 14, 2014)
- Appendix II: Decision of Lonny R. Bagley, Deputy State Director, Division of Energy, Lands and Minerals, Colorado State Office, BLM, upholding the denial of suspension requests for leases COC 65622 (March 19, 2012)
- Appendix JJ: Declaration of Eric R. Wahl, resident of Garfield County and member of Wilderness Workshop (April 18, 2014)
- Appendix KK: Notice of Proposed Action from Scott G. Fitzwilliams, Forest Supervisor, White River National Forest, for preparation of an Environmental

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Assessment of the Lava Boulder Creek Exploratory Development Program
(October 1, 2012)

From: Nada Culver
To: blm_ca_drecp@blm.gov; [Campbell, Vicki \(vlcampbell@blm.gov\)](mailto:Campbell,Vicki(vlcampbell@blm.gov))
Cc: jperez@blm.gov
Subject: comments on DRECP ACECs
Date: Monday, May 2, 2016 11:34:15 AM
Attachments: [DRECP Bishop ACECs - comment letter 5-2-16.pdf](#)

Hi Vicki – Attached is a joint comment letter addressing the management of certain ACECs in the DRECP planning area, along with the referenced photo. Thank you for your consideration of our comments. We're glad to answer questions or provide additional information.

As always, we appreciate all the work going into finalizing the DRECP, including this issue, and look forward to seeing the DRECP completed in the near future.

Nada Culver

Senior Counsel and Director, BLM Action Center

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May 2, 2016

Via electronic mail: blm_ca_drecp@blm.gov

Vicki Campbell, DRECP Program Manager
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Re: Comments on Areas of Critical Environmental Concern in the Desert Renewable Energy Conservation Plan Proposed Land Use Plan Amendment, California

Dear Ms. Campbell:

We are writing to express our concern over the Bureau of Land Management's (BLM) proposed management of five proposed Areas of Critical Environmental Concern (ACECs) located within the boundary of the Bishop Resource Management Plan (RMP) in the Proposed Desert Renewable Energy Conservation Plan (DRECP). The five ACECs we are concerned about include the Symmes Creek Wilderness Study Area (WSA), Independence Creek WSA, Crater Mountain WSA, Cerro Gordo WSA and the Southern Inyo Mountains WSA. As described in Appendix L of the Proposed DRECP Land Use Plan Amendment (LUPA), these five are subject to weaker management as compared to the other 129 ACECs included in the Proposed LUPA by exempting certain allowable activities from the caps on surface disturbance. In addition, these exempted activities are described very broadly, increasing the risk of harm to the values that these ACECs are proposed to protect. Unfortunately, this information was not presented in the Draft LUPA and was difficult to identify in Appendix L to the Proposed DRECP LUPA, so we are highlighting this concern for the agency at this time.

While we are pleased that BLM decided to institute stronger disturbance mitigation standards for all ACECs given individual unit resource needs, sensitivity to impacts, and current landscape conditions, we are disappointed that BLM has made considerable exceptions for these five ACECs in the Bishop RMP area. The management prescriptions for these five areas are not only inconsistent with BLM's statutory obligations, but they also threaten the important resources identified in each ACEC unit and undermine the DRECP's ACEC conservation delivery mechanism - disturbance caps.

We believe the management prescriptions for these five ACECs should be corrected to ensure they are managed consistently with the other proposed ACECs so all allowable land use activities are subject to an overlapping disturbance cap. We offer the following recommendations to correct this inconsistency and strengthen the value of the ACEC designations within the Bishop Field Office management area.

ACECs under the Federal Land Policy and Management Act

The Federal Land Policy and Management Act (FLPMA) obligates BLM to “give priority to the designation and protection of areas of critical environmental concern [ACECs].” 43 U.S.C. § 1712(c)(3). ACECs are considered unique areas where special, individualized management is necessary “to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes.” 43 U.S.C. § 1702(a). As a result, in order to meet its obligations under FLPMA, BLM must prioritize the management prescriptions for designated ACECs.

BLM has proactively identified and designated 134 ACECs under the DRECP. These areas exhibit a wide range of relevant and important historic, cultural or scenic values, fish and wildlife resources, and other natural systems and processes found in the desert; and, in designating them as ACECs, BLM is acknowledging that these areas require special management. As a result, BLM is required to provide “fully developed” special management prescriptions to protect these ACECs and their associated resources and values. *See*, Manual 1613, Sections .1 (Characteristics of ACECs), .22 (Develop Management Prescriptions for Potential ACECs), 43 C.F.R. § 8200.

Under the DRECP LUPA, the BLM is not only prescribing management actions for each designated ACEC, but it is also applying a “disturbance cap” for each unit area.

ACEC Disturbance Caps

Under the DRECP LUPA, disturbance caps are a conservation delivery mechanism intended to limit ground-disturbing activities. Since disturbance is measured as a percentage of the total BLM-managed ACEC acreage, it is essential that BLM consider all disturbances when assessing whether the cap has been reached. The BLM’s Proposed LUPA individualizes the disturbance caps for each ACEC and any sensitive sub-areas within them. This is an improvement from the Draft DRECP, which relied on a more generalized approach to disturbance cap allocations by assigning most areas with a blanket 0.5-1% disturbance cap. We are pleased that BLM’s disturbance caps in the Proposed LUPA better reflect each area’s resource needs, sensitivity to impacts, and current landscape conditions. By adopting stronger disturbance standards for each ACEC, BLM is helping to ensure harmful impacts are addressed, development in sensitive areas is avoided, and the integrity of the resources and values within each ACEC is maintained.

Unfortunately and inexplicably, the BLM’s management prescriptions for the five referenced ACECs in the Bishop RMP area are inconsistent with the purpose of the ACEC disturbance caps and pose a threat to the protected resources within those designated areas. The analysis in the FEIS failed to adequately call out the fact that only in these five ACECs are select ground-disturbing activities exempted from being used to calculate an ACEC’s disturbance level over the life of the DRECP LUPA. In effect, this would permit impactful activities to continue without changing the BLM calculation of the ACEC’s current level of disturbance. Similar activities in the other 129 ACECs, however, would be included in the area’s disturbance calculation. *See*, Appendix L. This difference in management is not explained, let alone justified, and appears arbitrary.

To preserve the integrity of the ACEC designations across the DRECP planning area, and ensure compliance with the requirements of FLPMA, we recommend that management prescriptions for these five ACECs prioritize the protection and restoration of their natural and cultural values by applying the proposed 0.25% disturbance cap for all activities. While activities intended to improve an area's natural condition or protect cultural resources may be necessary, the impacts to the landscape generated by these activities should not be excluded in calculating an area's level of disturbance. While they may provide a net benefit in the long term, all associated short term impacts must be accounted for to ensure ACEC values are protected.

Unfortunately, the BLM Bishop Field Office has determined that certain allowable activities permitted in the five individual ACECs should not be subject to the same protections as other ACECs, namely the disturbance cap. As illustrated below, these areas are rich in natural resources and cultural history, and like the 129 other ACECs in the proposed DRECP LUPA, all allowable uses in these ACECs and their impacts should be subject to the disturbance caps and included in disturbance calculations.

ACEC Values and Management Concerns

Each of the five ACECs, the specific activities that would not be subject to any disturbance cap and the concerns with this management approach are described below.

1. **Symmes Creek WSA.** The Symmes Creek WSA is comprised of 8,372 acres of public land located on the eastern slope of the Sierra Nevada and includes Shepherd Creek and a portion of Symmes Creek. Its wilderness characteristics include naturalness and outstanding opportunities for solitude and primitive and unconfined recreation. Upper elevations of the unit provide critical winter range for the Goodale mule deer herd, and overall it provides habitat and habitat connectivity for other wildlife species in the Sierra Nevada and Owens Valley. Mid to upper elevation lands will become more valuable in sustaining species vulnerable to increasing temperatures associated with global climate change, thus making this unit more ecologically valuable over time. The aquatic and riparian components of Shepherd Creek and Symmes Creek add to the unit's ecological and biological diversity, supporting Neotropical migratory birds and native species of macroinvertebrates and vertebrates, and having the potential for supporting endemic aquatic species such as spring-snails and salamanders. A recent site visit (generating the attached photo) has confirmed that Western Water Birch riparian lines both Symmes Creek and Shepherd Creek and also indicated that there are likely additional values present, such as rare plants that have not been identified previously. Accordingly, in developing appropriate management, we recommend BLM should also update its inventory of the values of the WSA and ACEC.

The existing use in the unit is livestock grazing associated with the Alabama Hills allotment. The proposed management activities include treatments to maintain or improve native vegetation communities and special status species habitats; selective removal of riparian vegetation and/or in-stream debris on Shepherd Creek to protect Manzanar National Historic Site from flooding.

Management Concerns. The BLM's proposed management activities would be exempt from compliance with the disturbance cap of 0.25% and the yearlong protection of riparian habitat. Motorized or off-road vehicle use would be allowed on existing roads and trails, which would also be maintained with mechanized equipment. The proposed activities including vegetation treatments, habitat improvement projects, and the alteration of Shepherd Creek to provide flood protection for the Manzanar National Historic Site (NHS) by removal of riparian vegetation and in-stream debris have the potential to adversely impact the natural and biological values of the unit.

2. Independence Creek WSA. This 6,840 acre unit is located on the eastern slope of the Sierra Nevada and includes George Creek. It has wilderness characteristics related to naturalness and outstanding opportunities for solitude and primitive and unconfined recreation. The upper elevations of the unit provide critical winter range for the Goodale mule deer herd, and generally provides habitat and habitat connectivity for other wildlife species in the Owens Valley and Sierra Nevada. Mid to upper elevation lands will become more valuable in sustaining species vulnerable to increasing temperatures associated with global climate change, thus making this unit more ecologically valuable over time. The aquatic and riparian components of George Creek add to the unit's ecological and biological diversity, supporting Neotropical migratory birds and native species of macroinvertebrates and vertebrates, and having the potential for supporting endemic aquatic species such as spring-snails and salamanders.

The existing use in the unit is livestock grazing associated with the Alabama Hills allotment. The proposed management activities include projects to maintain or improve fish and wildlife habitats and natural vegetation communities. Motorized or off-road vehicle use is allowed on existing roads, routes and trails, which may be maintained with mechanized equipment. The proposed habitat disturbance cap is 0.25%.

Management Concerns. The BLM's proposed activities intended to maintain and improve fish and wildlife habitat and natural vegetation communities would be exempt from compliance with the disturbance cap of 0.25%. The effects of livestock grazing on soil, vegetation and aquatic habitat associated with George Creek is a concern given the arid environment of the Owens Valley. Motorized or off-road vehicle use would be allowed on all existing roads and trails, which would also be maintained with mechanized equipment. The proposed allowable uses have the potential to adversely impact the natural and biological values of the unit.

3. Crater Mountain WSA. The proposed Crater Mountain WSA ACEC is 954 acres, which is a portion of the much larger WSA comprised of 6,597 acres. The WSA portion located outside the DRECP boundary is 5,735 acres and not subject to the proposed LUPA management requirements, although it has been an ACEC since 1993. The Crater Mountain unit's wilderness characteristics are naturalness and outstanding opportunities for solitude and primitive and unconfined recreation. The unit also supports important scenic and cultural values. The unit includes winter range for the Goodale mule deer herd as well as habitat for tule elk and other native species. Like the other units, it contributes connectivity habitat for animals and plants in the Owens Valley. Mid to upper elevation lands in the Crater Mountain WSA will become more valuable in sustaining species

vulnerable to increasing temperatures associated with global climate change, thus making this unit more ecologically valuable over time.

Livestock grazing is an existing use in the unit on both the West and East Crater Mountain allotments. Motorized or off-road vehicle use is allowed on existing roads, routes and trails, which may be maintained by mechanized equipment. Other proposed allowable activities include maintaining and improving native vegetation communities to support special status species, and other native species of fish and wildlife. The proposed habitat disturbance cap is 0.25%.

Management Concerns. The BLM's proposed activities intended to maintain and improve fish and wildlife habitat and natural vegetation communities would be exempt from compliance with the disturbance cap of 0.25%. Motorized or off-road vehicle use would be allowed on all existing roads and trails, which would also be maintained with mechanized equipment. Livestock grazing and associated grazing use projects have the potential to contribute to habitat loss. The proposed allowable uses have the potential to adversely impact the natural and biological values of the unit.

4. **Cerro Gordo WSA.** The proposed Cerro Gordo WSA ACEC is a 626 acre remnant of the Cerro Gordo Wilderness Study Area (CA-010-055) described in the California Statewide Wilderness Study Report (1990). The majority of the original unit (13,500 acres) was included in the Inyo Mountains Wilderness established by Congress in the California Desert Protection Act of 1994. It has wilderness characteristics due to naturalness and outstanding opportunities for solitude and primitive and unconfined recreation in the southwest Inyo Mountains, and is adjacent to the Inyo Mountains Wilderness and the primary access road to the historic mining town of Cerro Gordo. The unit contributes to the historic scenery associated with the historic mining town of Cerro Gordo as observed from both the town site and its primary access road. It also contributes to habitat connectivity for desert wildlife species in the Inyo Mountains. Management activities proposed by BLM include treatments to maintain or improve native vegetation communities and special status species habitats, and projects intended to maintain and improve wildlife habitats. The proposed disturbance cap is 0.25%, and BLM's proposed vegetation and habitat improvement projects would be exempt from the disturbance cap. Motorized or off-road vehicle use would be allowed on existing roads, routes and trails, which may be maintained by mechanized equipment.

Management Concerns. The BLM's proposed activities intended to maintain and improve fish and wildlife habitat and natural vegetation communities would be exempt from compliance with the disturbance cap of 0.25%. Motorized or off-road vehicle use would be allowed on all existing roads and trails, which would also be maintained with mechanized equipment. The proposed allowable uses have the potential to adversely impact the natural and biological values of the unit.

5. **Southern Inyo WSA.** The 2,930 acre Southern Inyo WSA is comprised of five separate remnants on the west slope of the Inyo Mountains which were not included in the Inyo Mountains Wilderness established through the California Desert Protection Act of 1994. It contributes to habitat connectivity for desert wildlife species in the Owens Valley and Inyo Mountains. One of the five units includes Long John Canyon and includes Long John Spring, a significant spring complex

that supports numerous species including the Inyo Mountains salamander, songbirds, quail and desert bighorn sheep.

Management activities proposed by BLM include designing and implementing treatments to maintain and improve native vegetation communities and special status species habitats, and projects intended to maintain and improve fish and wildlife habitats. Motorized or off-road vehicle use would be allowed on existing roads, routes and trails, which may be maintained by mechanized equipment. The proposed habitat disturbance cap is 0.25%. Treatments and projects intended to maintain and improve natural vegetation communities and wildlife habitat would be exempt from the disturbance cap.

Management Concerns. The BLM's proposed activities intended to maintain and improve fish and wildlife habitat and natural vegetation communities would be exempt from compliance with the disturbance cap of 0.25%. Motorized or off-road vehicle use would be allowed on all existing roads and trails, which would also be maintained with mechanized equipment. The proposed allowable uses have the potential to adversely impact the natural and biological values of the unit.

Recommendations

Within all of the ACECs discussed above, we recommend that all proposed allowable activities, including projects to facilitate livestock grazing and habitat lost due to motorized vehicle roads, routes and trails, be subject to the 0.25% disturbance cap so that the special values of the ACECs, and the existing WSAs, are adequately protected. Further, prior to approving such actions, BLM should detail the manner in which they would specifically lead to habitat protection and enhancement information, in order to be consistent with the management goals for the ACECs.

In addition, for the Symmes Creek WSA ACEC, BLM's proposed management activities and projects to maintain and improve natural vegetation communities, fish and wildlife habitat, and provide flood protection for the Manzanar NHS should be subject to the disturbance cap. Alternative means to provide flood protection for the Manzanar NHS as opposed to removal of native riparian vegetation and naturally occurring stream channel debris should be specified.

While some proposed management actions designed to maintain and restore natural communities may benefit native species and habitats in the long-term, this does not excuse the need to account for their short-term impacts when assessing whether the affected ACEC and WSA can sustain more disturbance. Disturbance caps will not necessarily prohibit activities. Rather, each allowable activity and proposed management action should be subject to a site-specific analysis under the National Environmental Policy Act (NEPA) in order to determine to what extent it would contribute to habitat loss or create impacts to the natural qualities of the unit, identify alternatives to proposed activities and identify effective impact mitigation measures. Although some activities to maintain and restore natural communities for the benefit of native species may be beneficial and not contribute to habitat loss, others may not, such as large-scale treatments using prescribed fire or creating artificial fuel breaks with mechanized equipment. This assessment must still occur but, regardless of their intended purpose and need, all allowable activities should be subject to the habitat disturbance cap.

We hope to see this inconsistent and unsupportable management approach corrected in the DRECP LUPA. Thank you for your attention to this important issue.

Sincerely,

Defenders of Wildlife

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cc: Jerome Perez, State Director (jperez@blm.gov)

From: Michael Saul
To: brcibley@blm.gov; wsvejnoh@blm.gov
Subject: Comments on 2016 National Petroleum Reserve in Alaska Oil and Gas Lease Sale
Date: Monday, May 2, 2016 6:28:59 PM
Attachments: [Center FOE NPRA nomination comment 5-2-16.pdf](#)
[Attachment A Wolf 2015 Alaskan climate change summary.pdf](#)
[Attachment B.pdf](#)
[Attachment C.pdf](#)

Dear Director Cribley,

Please find attached the comments, with three attachments, of the Center for Biological Diversity and Friends of the Earth on BLM's Call for Nominations and Comments for the 2016 National Petroleum Reserve in Alaska Oil and Gas Lease Sale.

Please do not hesitate to call or email if you have questions regarding these comments.

Sincerely,

Michael Saul

Senior Attorney, Public Lands

Center for Biological Diversity

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April 29, 2016

Via email: bcribley@blm.gov, wsvejnoh@blm.gov

Bud Cribley, State Director
BLM-Alaska State Office
222 West 7th Ave., #13
Anchorage, AK, 99513

Re: Call for Nominations and Comments for the 2016 National Petroleum Reserve-Alaska Oil and Gas Lease Sale (62 Fed. Reg. 18,643 (Mar. 31, 2016))

Dear Director Cribley:

Thank you for the opportunity to submit comments on tracts for 2016 leasing within the National Petroleum Reserve in Alaska (Reserve). These comments are submitted on behalf of the Center for Biological Diversity and Friends of the Earth in Alaska and throughout the United States.

The Center is a non-profit environmental organization with over one million members and supporters, including members who live near and recreate in Alaska. The Center uses science, policy and law to advocate for the conservation and recovery of species on the brink of extinction and the habitats they need to survive.

Friends of the Earth is a 501(c)(3) organization with over 33,000 members and 496,000 activists nationwide, including 1,273 who live in Alaska. FoE's mission is to protect our natural environment, including air, water and land, to create a more healthy and just world."

The Center and Friends of the Earth submit that BLM should not offer any leases for sale in 2016. In recognition of the urgent need to address the threat of climate change and the role of fossil fuel extraction and combustion, BLM should refrain from issuing any new leases within the Reserve. Documented impacts and science-based predictions of climate change in the Arctic region include sea level rise, temperature increase and fluctuation, loss of sea ice, changes in ocean circulation patterns, ocean acidification, increased tundra fires, changes in vegetation type and cover and coastal erosion, among others. These changes, combined with oil and gas development, threaten to destroy the unique and special ecological communities of the Reserve.¹

¹ For a detailed description of the impacts to the Reserve from oil and gas development and climate change, please see the Center's June 15, 2012, Comment Letter on the National Petroleum Reserve-Alaska Integrated Activity Plan and Environmental Impact Statement, and references cited therein, which is attached here as Attachment B and incorporated by reference. In addition to the references cited in the June 2012 letter, the Center submits for the

On December 12, 2015, nearly 200 governments, including the United States, agreed to the commitments enumerated in the Paris Agreement to “strengthen the global response to the threat of climate change”² The Paris Agreement codified the international consensus that the climate crisis is an urgent threat to human societies and the planet, with the parties recognizing that:

Climate change represents an *urgent and potentially irreversible threat to human societies and the planet* and thus requires the widest possible cooperation by all countries, and their participation in an effective and appropriate international response, with a view to accelerating the reduction of global greenhouse gas emissions (emphasis added).³

Numerous authoritative scientific assessments have established that climate change is causing grave harms to human society and natural systems, and these threats are becoming increasingly dangerous. The Intergovernmental Panel on Climate Change, in its 2014 Fifth Assessment Report, stated that: “[w]arming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased” and that “[r]ecent climate changes have had widespread impacts on human and natural systems.”⁴

The United States’ 2014 Third National Climate Assessment, prepared by a panel of non-governmental experts and reviewed by the National Academy of Sciences and multiple federal agencies similarly stated “[t]hat the planet has warmed is ‘unequivocal,’ and is corroborated through multiple lines of evidence, as is the conclusion that the causes are very likely human in origin”⁵ and “[i]mpacts related to climate change are already evident in many regions and are expected to become increasingly disruptive across the nation throughout this century and beyond.”⁶ The United States National Research Council similarly concluded that: “[c]limate change is occurring, is caused largely by human activities, and poses significant risks for—and in

record, as Attachment A, a summary and list of recent papers relevant to climate change impacts in the Reserve that the BLM must consider.

² United Nations Framework Convention on Climate Change, Conference of the Parties Nov. 30-Dec. 11, 2015, Adoption of the Paris Agreement Art. 2, U.N. Doc. FCCC/CP/2015/L.9 (Dec. 12, 2015), available at <http://unfccc.int/resource/docs/2015/cop21/eng/109.pdf> (“Paris Agreement”).

³ Paris Agreement, Decision, Recitals.

⁴ IPCC AR5 Synthesis Report at 2.

⁵ Melillo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, Eds., 2014: Climate Change Impacts in the United States: The Third National Climate Assessment (U.S. Global Change Research Program). doi:10.7930/J0Z31WJ2 (Third National Climate Assessment) at 61 (quoting IPCC, 2007: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, S. Solomon, D. Qin, M. Manning, Z. Chen, M. Marquis, K. B. Averyt, M. Tignor, and H. L. Miller, Eds., Cambridge University Press, 1-18.).

⁶Third National Climate Assessment at 10.

many cases is already affecting—a broad range of human and natural systems.”⁷

The IPCC and National Climate Assessment further decisively recognize the dominant role of fossil fuels in driving climate change:

While scientists continue to refine projections of the future, observations unequivocally show that climate is changing and that the warming of the past 50 years is primarily due to human-induced emissions of heat-trapping gases. These emissions come mainly from burning coal, oil, and gas, with additional contributions from forest clearing and some agricultural practices.⁸

CO₂ emissions from fossil fuel combustion and industrial processes contributed about 78% to the total GHG emission increase between 1970 and 2010, with a contribution of similar percentage over the 2000–2010 period (*high confidence*).⁹

These impacts of fossil fuels are harming the United States in myriad ways, with the impacts certain to worsen over the coming decades absent deep reductions in domestic and global GHG emissions. EPA recognized these threats in its 2009 Final Endangerment Finding under Clean Air Act Section 202(a), concluding that greenhouse gases endanger public health and welfare: “the body of scientific evidence compellingly supports [the] finding” that “greenhouse gases in the atmosphere may reasonably be anticipated both to endanger public health and to endanger public welfare.”¹⁰

As acknowledged by the BLM in Appendix C to the 2012 Reserve Integrated Activity Plan Final Environmental Impact Statement, climate change impacts are already having disproportionate effects in Alaska, and will continue to have increasingly severe impacts on average temperatures, melting of sea ice, thawing permafrost, and acidifying oceans.

Climate changes impacts in Alaska are “already pronounced,” as summarized by the 2014 National Climate Assessment, including greater-than-average warming, rapid melting of sea ice, widespread glacier retreat, thawing permafrost, and rapid ocean acidification (Melillo et al. 2014).

Alaska has warmed more than twice as rapidly as the rest of the United States over the past 60 years (Melillo et al. 2014). During this period, average annual temperatures in Alaska increased by 3°F, with 6°F of warming in winter (Melillo et al. 2014). Absent significant reductions in greenhouse gas emissions, Alaska is expected to warm by an additional 10°F to 12°F in the north, 8°F to 10°F in the interior, and 6°F to 8°F in the rest of the state by the end of the century (Melillo et al. 2014).

⁷ National Research Council, *Advancing the Science of Climate Change* (2010), available at www.nap.edu. (“Advancing the Science of Climate Change”) at 2.

⁸ Third National Climate Assessment at 2.

⁹ IPCC AR5 Synthesis Report at 46.

¹⁰ Final Endangerment Finding, 74 Fed. Reg. at 66,497.

One of the most disruptive consequences of climate change is the rapid melting of Arctic sea ice. Arctic summer sea ice is receding faster than climate models have predicted and is expected to virtually disappear before mid-century (Melillo et al. 2014). Summer sea ice extent and thickness have decreased by half over the past few decades (Stroeve et al. 2008, Kwok and Rothrock 2009, Melillo et al. 2014), with an accompanying drastic reduction in volume (Schweiger et al. 2012). The length of the sea ice season is shortening, as ice melts earlier in spring and forms later in autumn (Parkinson 2014). Sea-ice losses have been particularly large in the Chukchi and Beaufort Seas (Meier et al. 2007, Parkinson and Cavalieri 2008). In the Chukchi and Beaufort Seas, sea-ice thickness declined by -64% and -50%, respectively, between 1958 to 2007 (Kwok and Rothrock 2009), and the length of the ice season decreased by 35 days between 1979 and 2007 (Markus et al. 2009).

Arctic summer sea ice is expected to virtually disappear before mid-century, with estimates of 2020 or earlier, 2030 on average, and 2040 or later based on three modeling approaches (Overland and Wang 2013). Winter sea ice is also declining faster than IPCC climate models have projected (Stroeve et al. 2007). In the Bering Sea, winter (March and April) sea-ice cover is expected to decline by ~43% by 2050 under a mid-range A1B emissions scenario (Wang et al. 2010). The rapid loss of Arctic sea ice is disrupting ecosystems, leading to greater access for shipping and offshore development, and increasing vulnerability to coastal erosion (Melillo et al. 2014).

Alaska houses some of the world's largest glaciers and is experiencing among the fastest losses of glacial ice on the planet, which has been attributed to rising temperatures from global warming (Melillo et al. 2014). More than 98% of Alaska's glaciers are retreating and/or thinning, leading to massive ice loss (Molnia 2007), and the rate of Alaskan glacier retreat and thinning has accelerated in recent decades (Arendt et al. 2002, Dyurgerov and McCabe 2006). The global decline in glacial ice loss is predicted to be one of the largest contributors to global sea level rise during this century (Melillo et al. 2014).

Permafrost underlies 80% of the land surface in Alaska, and permafrost thaw is already underway in interior and southern Alaska where permafrost temperatures are near the thaw point (Melillo et al. 2014). In northern Alaska, permafrost temperature has increased by up to 2 to 3°C since the 1980s, including areas of the coastal Arctic National Wildlife Refuge (Jorgenson et al. 2006, Osterkamp and Jorgenson 2006). Models project that permafrost in Alaska will continue to thaw, and that near-surface permafrost may be entirely lost from large parts of Alaska by the end of the century (Melillo et al. 2014). As permafrost thaws, it releases carbon dioxide and the powerful greenhouse gas methane into the atmosphere, which contribute to further warming in a reinforcing feedback loop (Koven et al. 2011, Schaefer et al. 2011). Permafrost plays an essential role in the Alaskan ecosystem by making the ground watertight and maintaining the vast network of wetlands and lakes across the tundra that provide habitat for animals and plants.

Alaskan shorelines are eroding at an accelerating rate due to the combined effects of sea-ice loss, increasing sea surface temperatures, increasing terrestrial permafrost degradation, rising sea levels, and increases in storm power and corresponding wave action (Jones et al. 2009). In Alaska, coastal erosion rates have doubled in the past 50 years along the Beaufort Sea shoreline

(Lantuit and Pollard 2008, Mars and Houseknecht 2008, Jones et al. 2009). Increasing coastal erosion jeopardizes species that use coastal habitats for breeding, such as the polar bear, which uses coasts and barrier islands for denning (Durner et al. 2006).

Sea level rise in many regions of the Arctic is advancing much faster than the global average, with particularly rapid increases in sea level occurring in recent years. Global average sea level rose by roughly eight inches (19 centimeters) over the past century, and sea level rise is accelerating in pace (IPCC 2013, Melillo et al. 2014). Recent studies indicate that a global mean sea level rise of 3 to 4 feet is likely within this century, and 6.6 feet is possible, with estimates as follows: 0.5 to 1.4 m (Rahmstorf 2007), 0.75 m to 1.90 m (Vermeer and Rahmstorf 2009), 0.8 m to 2.0 m (Pfeffer et al. 2008), 0.8 m to 1.3 m (Grinsted et al. 2010), and 0.6 m to 1.6 m (Jevrejeva et al. 2010). In its 2012 sea-level rise assessment, the National Research Council estimated global sea level rise at 8 to 23 cm by 2030, 18 to 48 cm by 2050, and 0.5 m to 1.4 m by 2100 (NRC 2012). The 2014 National Climate Assessment reported that sea level is projected to rise by 1 to 4 feet in this century, with the possibility of 6.6 feet of rise (Melillo et al. 2014).

The waters off Alaska are particularly vulnerable to ocean acidification (Fabry et al. 2009, Feely et al. 2009, Mathis et al. 2015). Seasonal aragonite undersaturation is already occurring in the Bering, Chukchi, and Beaufort Seas (Bates et al. 2009, Fabry et al. 2009, Yamamoto-Kawai et al. 2009). Mean surface pH values in the Gulf of Alaska, Bering, Chukchi and Beaufort Seas have decreased by 0.1 to 0.14 pH units since pre-industrial times, equivalent to a more 30% increase in acidity, with future surface pH projected to decrease by another 0.34 to 0.37 pH units by the end of the century (Mathis et al. 2015: Table 2). If current emissions trends continue, by 2050 all Arctic surface waters are expected to be corrosive to organisms that use aragonite to build their shells, and that most of the Arctic, including regions of the Bering and Chukchi Seas, will be corrosive to calcite-using organisms by 2095 (Fabry et al. 2009, Feely et al. 2009).

In light of the Paris Agreement, the President's stated climate goals, and the significant new information available since the 2012 IAP/FEIS, including the Third National Climate Assessment and the International Panel on Climate Change's (IPCC's) Fifth Assessment Report, there is an overwhelming need to cease new leasing of federal fossil fuels until comprehensive policies can be developed and actions taken to mitigate greenhouse gas emissions and put the nation and world on a path to keeping warming under 1.5°C.

Immediate and aggressive greenhouse gas emissions reductions are necessary to limit global warming to a 1.5°C rise above pre-industrial levels. Put simply, there is only a finite amount of CO₂ that can be released into the atmosphere without rendering the goal of meeting the 1.5°C (or even a 2°C) target virtually impossible. Globally, proven fossil fuel reserves, let alone additional recoverable resources,¹¹ if extracted and burned, would release enough CO₂ to

¹¹ According to the Congressional Research Service, “[p]roved reserves are those amounts of oil, natural gas, or coal that have been discovered and defined at a significant level of certainty, typically by drilling wells or other exploratory measures, and which can be economically recovered. In the United States, proved reserves are typically measured by private companies, who report their findings to the Securities and Exchange Commission because those reserves are considered capital assets. Because proved reserves are defined by strict rules, they do not include all of the oil or gas in a region, but only those amounts that have been carefully confirmed. . . . Undiscovered resources are

exceed this limit several times over.¹² Consequently, the vast majority of fossil fuels must remain in the ground. The physical question of what amount of fossil fuels can be extracted and burned without negating a realistic chance of meeting a 1.5°C or even 2°C target is relatively easy to answer. The Fifth Assessment Report of the IPCC and other expert assessments have established global carbon budgets, or the total amount of remaining carbon that can be burned while maintaining some probability of staying below a given temperature target. According to the IPCC, total cumulative anthropogenic emissions of CO₂ must remain below about 1,000 gigatonnes (GtCO₂) from 2011 onward for a 66% probability of limiting warming to 2°C above pre-industrial levels.¹³ The Paris Agreement aim of limiting the temperature increase to 1.5°C requires a more stringent carbon budget of only 400 GtCO₂ from 2011 onward (of which more than 100 GtCO₂ has already been emitted)¹⁴ for a 66% probability of limiting warming to 1.5°C above pre-industrial levels.¹⁵ Increasing the odds of meeting these targets requires meeting even stricter carbon budgets.¹⁶ Given that global CO₂ emissions in 2014 alone totaled 36 GtCO₂,¹⁷ humanity is rapidly consuming the remaining burnable carbon budget needed to have even a 66% chance of meeting the 1.5°C temperature limit.

For the world to stay within a carbon budget consistent with a 1.5°C temperature limit, significant fossil fuels around the world need to be left in the ground. The United States alone contains enough recoverable fossil fuels, split about evenly between federal and non-federal resources, that if extracted and burned, would approach the entire global carbon budget for a 2°C

amounts of oil and gas estimated to exist in unexplored areas. Estimates of undiscovered resources for the United States are made by the U.S. Geological Survey for resources on land, and by the Bureau of Ocean Energy Management Regulation and Enforcement (formerly the Minerals Management Service) [now simply the Bureau of Ocean Energy Management] for resources offshore. These assessments are based on observation of geological characteristics similar to producing areas and many other factors. Reported statistics for undiscovered resources may vary greatly in precision and accuracy (determined retrospectively), which are directly dependent upon data availability, and their quality may differ for different fuels and different regions.” Whitney, Gene *et al.*, Cong. Research Serv., R40872, U.S. Fossil Fuel Resources: Terminology, Reporting and Summary 4-5 (2010).

¹² See, e.g., IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change at 64 & Table 2.2 [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)] at 63-64 & Table 2.2. (“IPCC AR5 Synthesis Report”); Marlene Cimos, Keep It In the Ground 6 (Sierra Club *et al.*, Jan. 25, 2016).

¹³ IPCC, 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change; Summary for Policymakers at 27 (“IPCC AR5 Physical Science Basis”). See also IPCC AR5 Synthesis Report at 63-64 & Table 2.2. Higher probabilities of success require stricter carbon limits; to have an 80% probability of staying below the 2°C target, the budget from 2000 is 890 GtCO₂, with less than 430 GtCO₂ remaining. See Meinshausen, M. *et al.*, Greenhouse gas emission targets for limiting global warming to 2 degrees Celsius, 458 Nature 1158–1162 (2009) (“Meinshausen *et al.* 2009”) at 1159; Carbon Tracker Initiative, Unburnable Carbon – Are the world’s financial markets carrying a carbon bubble? available at <http://www.carbontracker.org/wp-content/uploads/2014/09/Unburnable-Carbon-Full-rev2-1.pdf>.

¹⁴ From 2012-2014, 107 GtCO₂ was emitted (see Annual Global Carbon Emissions at <http://co2now.org/Current-CO2/CO2-Now/global-carbon-emissions.html>). Given additional emissions in 2015, the remaining carbon budget for 1.5°C would now be well below 300 GtCO₂ (approximately 450 Gt CO₂e)

¹⁵ IPCC AR5 Synthesis Report at 64 & Table 2.2.

¹⁶ See Meinshausen *et al.* at 1159; Carbon Tracker Initiative 2013, Unburnable Carbon.

¹⁷ See Global Carbon Emissions, <http://co2now.org/Current-CO2/CO2-Now/global-carbon-emissions.html>.

target, and exceed the remaining budget for a 1.5°C limit.¹⁸ Clearly, even if the rest of the world somehow reduced its carbon emissions to near zero, the United States still could not safely burn all of its own fossil fuel resources. The majority of United States fossil fuels simply must be kept in the ground.

Unleased federal fossil fuels, if extracted and burned, would consume between roughly 70 and 100% of a *global* budget of 450 GtCO₂e, the amount remaining at the start of 2016 under a budget scenario that itself has only a 66% chance of limiting temperature increase to 1.5°C.¹⁹ Under a more cautionary budget (i.e., one with a higher probability of success), unleased federal fossil fuels alone could exceed the entire global budget. Continued leasing of these fossil fuels, without examining the climate consequences of such action, is incompatible with any reasonable domestic and international path to limiting warming to 1.5°C or even 2°C.

Two recent studies estimated that global oil, gas, and coal resources considered currently economically recoverable contain potential greenhouse gas emissions estimated at 2,900 GtCO₂²⁰ and 4196 GtCO₂²¹ respectively. Other sources estimate even greater global fossil fuel reserves at 3,677 to 7,120 GtCO₂.²² When considering all fossil fuel resources (defined as those recoverable over all time with both current and future technology irrespective of current economic conditions), potential combustion emissions have been estimated at nearly 11,000 GtCO₂²³ upwards to 31,353 and 50,092 GtCO₂.²⁴

Even the lowest of these estimates (2,900 GtCO₂) is more than three times greater than the most generous carbon budget nominally consistent with a 2°C temperature limit (~900 GtCO₂), while the largest (50,092 GtCO₂) is over 160 times greater than the remaining budget for a 66% probability of not exceeding a 1.5°C limit (<300 GtCO₂).

As stated by one study, “the disparity between what resources and reserves exist and

¹⁸ See Mulvaney, Dustin *et al.*, The Potential Greenhouse Gas Emissions of U.S. Federal Fossil Fuels 4 (EcoShift Consulting 2015) (Attachment C).

¹⁹ *Id.* The emission potential of unleased federal fossil fuels are estimated at 319-450 GtCO₂e. The global carbon budget at the start of 2015 for a 66% chance of limiting temperature increase to 1.5°C was approximately 300 GtCO₂ which is equivalent to ~450 GtCO₂e, meaning that the potential emissions of unleased federal fossil fuels would consume 70 to 100% of this global budget. There is no single universally applicable factor for converting between CO₂ and CO₂e because the ultimate radiative forcing potential of fossil fuel extraction and combustion depends on a number of assumptions regarding the production and use of those fuels. In this Petition we use a conversion factor of 1 GtCO₂ = 1.5 GtCO₂e based on Table 1 in Meinshausen *et al.* 2009.

²⁰ McGlade and Ekins at 187-192.

²¹ Raupach, M. *et al.*, Sharing a quota on cumulative carbon emissions. 4 Nature Climate Change 873-879 (2014) at Figure 2.

²² IPCC, 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change at Table 7.2 [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. (“IPCC AR5 Mitigation of Climate Change”)

²³ McGlade and Ekins at 188.

²⁴ IPCC AR5 Mitigation of Climate Change at Table 7.2.

what can be emitted while avoiding a temperature rise greater than the agreed 2C limit is therefore stark.”²⁵ Another recent report on global carbon reserves found that:

The reserves of coal, oil and natural gas outlined in this report contain enough carbon to rocket the planet far beyond the 2 °C limit. Warming from fossil fuels puts other carbon sinks at risk. As permafrost melts and peat bogs dry, they emit enormous quantities of carbon dioxide, furthering a chain reaction where the release of carbon results in a warmer world, which in turn releases more carbon.²⁶

Under *any* formulation, the vast majority of United States fossil fuels, must stay in the ground if we are to have any realistic hope of staying below 1.5°C, or even 2°C of warming. A recent detailed analysis found that the United States alone contains enough recoverable fossil fuels, split about evenly between federal and non-federal resources, which if extracted and burned, would generate enough greenhouse emissions (median estimate 840 GtCO₂e) to consume more than half the entire global carbon budget for a 2°C target (~900 GtCO₂, equivalent to ~1350 GtCO₂e), and greatly exceed the remaining budget for a 1.5°C target (~300 GtCO₂ equivalent to ~450 GtCO₂e).²⁷ Clearly, even if the rest of the world somehow reduced its carbon emissions to near zero, the United States still could not safely burn all of its own fossil fuels.

This analysis highlights the impossibility of reconciling continued leasing of federal fossil fuels with a pathway to keeping warming from exceeding 1.5°C. Total remaining fossil fuel resources in the United States, including both federal and non-federal resources, are estimated to equate to 697 to 1070 GtCO₂e of emissions.²⁸ Federal fossil fuels represent about half (46-50%) of that total at between 349 and 492 GtCO₂e of potential emissions,²⁹ and the vast majority (91%) of federal fossil fuels are still unleased.³⁰ Overall the potential greenhouse gas emissions of unleased federal fossil fuel resources are enormous, estimated at 319 to 450 GtCO₂e. In other words, unleased federal fossil fuels, if extracted and burned, would consume between 70 and 100% of a *global* budget of 300 GtCO₂ (equivalent to ~450 GtCO₂e), the amount remaining at the start of 2015 under a budget scenario that itself has only a 66% chance of limiting temperature increase to 1.5°C.

As described above, United States resources greatly exceed the *entire* global budget for a

²⁵ McGlade and Ekins at 188.

²⁶ Cimonis at 6.

²⁷ See Mulvaney *et al.* at 4. Using a metric of CO₂e (which also includes conservative estimates for the radiative forcing potential of non-CO₂ greenhouse gases such as methane, compare Mulvaney *et al.* at Table A12 with IPCC AR5 Physical Science Basis at 714 & Table 8.7), this study calculated that extraction and combustion of total U.S. recoverable fossil fuels would produce 697 to 1070 GtCO₂e of emissions, with a median estimate of 840 GtCO₂e. To compare these emissions to the global carbon budgets for 1.5°C and 2°C, we converted these carbon budgets from to GtCO₂ to GtCO₂e by applying a conversion factor of 1 GtCO₂ = 1.5 GtCO₂e based on Table 1 in Meinshausen *et al.* 2009.

²⁸ Mulvaney *et al.* 19 Table 2.

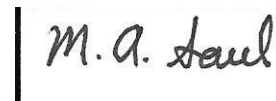
²⁹ *Id.* at 18.

³⁰ *Id.*

66% chance of limiting warming to 1.5°C. Emissions from use of the median estimate of non-federal fossil fuels (435 GtCO₂e) themselves would use up almost the entire global budget, while unleased fossil fuels alone (370 GtCO₂e) would utilize over 80% of that budget. Even under a carbon budget in which great risk to human health, prosperity, and stability and the planet's natural systems is tolerated (only 50% chance of staying below 2°C) the United States still cannot utilize the entirety of its non-federal fossil fuel resources, much less those under direct federal control.

For these reasons, BLM should refrain from issuing any new leases within the Reserve. As set forth above and in Attachments A and B, documented impacts and science-based predictions of climate change in the Arctic region include sea level rise, temperature increase and fluctuation, loss of sea ice, changes in ocean circulation patterns, ocean acidification, increased tundra fires, changes in vegetation type and cover and coastal erosion, among others. These changes, combined with oil and gas development, threaten to destroy the unique and special ecological communities of the Reserve. In order to ensure adequate protection of the unique and sensitive resources it is entrusted with conserving, BLM should not hold a 2016 lease sale for the Reserve, and should refrain from issuing any new leases until such time as it can ensure that federal fossil fuel policy leasing is consistent with national climate goals and a path to limiting warming to 1.5°C.

Respectfully submitted this 2nd day of May, 2016,

A handwritten signature in black ink that reads "M. A. Saul". The signature is written in a cursive style and is positioned to the right of a vertical line.

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Cc: Wayne Svenjnoha, BLM Alaska

Alaska climate change summary

Climate changes impacts in Alaska are “already pronounced,” as summarized by the 2014 National Climate Assessment, including greater-than-average warming, rapid melting of sea ice, widespread glacier retreat, thawing permafrost, and rapid ocean acidification (Melillo et al. 2014).

Alaska has warmed more than twice as rapidly as the rest of the United States over the past 60 years (Melillo et al. 2014). During this period, average annual temperatures in Alaska increased by 3°F, with 6°F of warming in winter (Melillo et al. 2014). Absent significant reductions in greenhouse gas emissions, Alaska is expected to warm by an additional 10°F to 12°F in the north, 8°F to 10°F in the interior, and 6°F to 8°F in the rest of the state by the end of the century (Melillo et al. 2014).

One of the most disruptive consequences of climate change is the rapid melting of Arctic sea ice. Arctic summer sea ice is receding faster than climate models have predicted and is expected to virtually disappear before mid-century (Melillo et al. 2014). Summer sea ice extent and thickness have decreased by half over the past few decades (Stroeve et al. 2008, Kwok and Rothrock 2009, Melillo et al. 2014), with an accompanying drastic reduction in volume (Schweiger et al. 2012). The length of the sea ice season is shortening, as ice melts earlier in spring and forms later in autumn (Parkinson 2014). Sea-ice losses have been particularly large in the Chukchi and Beaufort Seas (Meier et al. 2007, Parkinson and Cavalieri 2008). In the Chukchi and Beaufort Seas, sea-ice thickness declined by -64% and -50%, respectively, between 1958 to 2007 (Kwok and Rothrock 2009), and the length of the ice season decreased by 35 days between 1979 and 2007 (Markus et al. 2009).

Arctic summer sea ice is expected to virtually disappear before mid-century, with estimates of 2020 or earlier, 2030 on average, and 2040 or later based on three modeling approaches (Overland and Wang 2013). Winter sea ice is also declining faster than IPCC climate models have projected (Stroeve et al. 2007). In the Bering Sea, winter (March and April) sea-ice cover is expected to decline by ~43% by 2050 under a mid-range A1B emissions scenario (Wang et al. 2010). The rapid loss of Arctic sea ice is disrupting ecosystems, leading to greater access for shipping and offshore development, and increasing vulnerability to coastal erosion (Melillo et al. 2014).

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since the 1980s, including areas of the coastal Arctic National Wildlife Refuge (Jorgenson et al. 2006, Osterkamp and Jorgenson 2006). Models project that permafrost in Alaska will continue to thaw, and that near-surface permafrost may be entirely lost from large parts of Alaska by the end of the century (Melillo et al. 2014). As permafrost thaws, it releases carbon dioxide and the powerful greenhouse gas methane into the atmosphere, which contribute to further warming in a reinforcing feedback loop (Koven et al. 2011, Schaefer et al. 2011). Permafrost plays an essential role in the Alaskan ecosystem by making the ground watertight and maintaining the vast network of wetlands and lakes across the tundra that provide habitat for animals and plants.

Alaskan shorelines are eroding at an accelerating rate due to the combined effects of sea-ice loss, increasing sea surface temperatures, increasing terrestrial permafrost degradation, rising sea levels, and increases in storm power and corresponding wave action (Jones et al. 2009). In Alaska, coastal erosion rates have doubled in the past 50 years along the Beaufort Sea shoreline (Lantuit and Pollard 2008, Mars and Houseknecht 2008, Jones et al. 2009). Increasing coastal erosion jeopardizes species that use coastal habitats for breeding, such as the polar bear, which uses coasts and barrier islands for denning (Durner et al. 2006).

Sea level rise in many regions of the Arctic is advancing much faster than the global average, with particularly rapid increases in sea level occurring in recent years. Global average sea level rose by roughly eight inches (19 centimeters) over the past century, and sea level rise is accelerating in pace (IPCC 2013, Melillo et al. 2014). Recent studies indicate that a global mean sea level rise of 3 to 4 feet is likely within this century, and 6.6 feet is possible, with estimates as follows: 0.5 to 1.4 m (Rahmstorf 2007), 0.75 m to 1.90 m (Vermeer and Rahmstorf 2009), 0.8 m to 2.0 m (Pfeffer et al. 2008), 0.8 m to 1.3 m (Grinsted et al. 2010), and 0.6 m to 1.6 m (Jevrejeva et al. 2010). In its 2012 sea-level rise assessment, the National Research Council estimated global sea level rise at 8 to 23 cm by 2030, 18 to 48 cm by 2050, and 0.5 m to 1.4 m by 2100 (NRC 2012). The 2014 National Climate Assessment reported that sea level is projected to rise by 1 to 4 feet in this century, with the possibility of 6.6 feet of rise (Melillo et al. 2014).

The waters off Alaska are particularly vulnerable to ocean acidification (Fabry et al. 2009, Feely et al. 2009, Mathis et al. 2015). Seasonal aragonite undersaturation is already occurring in the Bering, Chukchi, and Beaufort Seas (Bates et al. 2009, Fabry et al. 2009, Yamamoto-Kawai et al. 2009). Mean surface pH values in the Gulf of Alaska, Bering, Chukchi and Beaufort Seas have decreased by 0.1 to 0.14 pH units since pre-industrial times, equivalent to a more 30% increase in acidity, with future surface pH projected to decrease by another 0.34 to 0.37 pH units by the end of the century (Mathis et al. 2015: Table 2). If current emissions trends continue, by 2050 all Arctic surface waters are expected to be corrosive to organisms that use aragonite to build their shells, and that most of the Arctic, including regions of the Bering and Chukchi Seas, will be corrosive to calcite-using organisms by 2095 (Fabry et al. 2009, Feely et al. 2009).

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Attachment B:

**Center for Biological Diversity Comment Letter on the
National Petroleum Reserve-Alaska Integrated Activity Plan
and Environmental Impact Statement, June 15, 2012**



SUBMITTED VIA HAND DELIVERY

June 15, 2012

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Re: NPR-A Draft IAP/EIS Comments

Thank you for the opportunity to comment on the Bureau of Land Management's (BLM) Draft Environmental Impact Statement (DEIS) regarding the National Petroleum Reserve Alaska (NPR-A). These comments are submitted on behalf of the Center for Biological Diversity (the Center).

The four alternatives currently included in the DEIS all would have substantial impacts to this vast and relatively pristine wilderness area, with a minimum of 50 percent of the NPR-A offered for lease sales for oil and gas development under the most environmentally protective Alternative B. Connected actions associated with commercial oil and gas development in the NPR-A include a gas pipeline to Anchorage, Alaska, another gas pipeline to Canada, the infrastructure associated with oil and gas development within the NPR-A, and a future pipeline through the NPR-A from offshore oil and gas development in the Chukchi Sea. The significant environmental impacts from offshore oil and gas development would be enabled in large part through infrastructure and pipelines on the NPR-A, and the DEIS makes it clear that this infrastructure is part of the purpose of lease sales under any alternative. Thus, offshore development is largely contingent on lease sales in the NPR-A.

The Center does not support lease sales anywhere in the NPR-A. Any development threatens to destroy the wilderness and roadless characteristics of this vast and ecologically critical area, and would allow for further ecological damage and significant amounts of greenhouse gas emissions through commercial development of oil and gas in the NPR-A and from offshore oil and gas development. Climate change impacts are a huge threat to the ecological communities of the NPR-A and the Arctic. Documented impacts and science-based predictions of climate change in the Arctic region include sea level rise, temperature increase and fluctuation, loss of sea ice, changes in ocean circulation patterns, ocean acidification, increased tundra fires, changes in vegetation type and cover, and coastal erosion, among others. The FEIS must consider the

impacts of oil and gas development in the context of climate change, both in terms of the greenhouse gas emissions produced under each alternative, and cumulative impacts of habitat degradation and direct disturbance resulting from oil and gas activities.

Due to the profoundly negative effects of oil and gas development on the ecological communities of the NPR-A, the FEIS should include an environmentally protective alternative that allows for no lease sales as the no-action alternative. In the event the BLM proceeds with lease sales in the NPR-A, we urge the BLM to select a modified Alternative B as the preferred Alternative. A modified Alternative B (Alternative B+) must replace the nonbinding measures currently included in the DEIS Special Area designations with clear and legally binding language permanently protecting significant wildlife and habitat areas from oil and gas development. These protected areas must include all of the Special Areas and environmentally protective measures in the DEIS's Alternative B and should permanently protect additional ecologically important areas in order to maintain the wilderness characteristics of the NPR-A and to provide undisturbed habitat for wildlife as sea level rise, changes in vegetation type and seasonality, and other ecological changes greatly reduce quantity and quality of inland and thermokarst habitat over the next century. These changes will be especially prevalent on the coastal plain. The environmental review of lease sales offered under any alternative must include an analysis of climate change impacts, alternatives to reduce greenhouse gas emissions, impacts on endangered, threatened and sensitive species, and mitigation measures to reduce all such impacts.

The alternative analysis in the DEIS is incomplete and inadequate in considering the compounding impacts of climate change and oil and gas development on the ecological and wilderness characteristics of the NPR-A. While Chapter 3 of the DEIS (Affected Environment) discusses some of the potential impacts of climate change on specific resources, these impacts are not analyzed adequately in Chapter 4 (Environmental Consequences). For some important ecological resources, climate change is only given perfunctory mention but not considered in regards to oil and gas development (e.g., Vegetation section 4.3.5.4). Specifically, critical climate change issues including sea level rise, coastal erosion, and methane gas leakage and emissions receive no or little attention in the DEIS.

The DEIS fails to adequately disclose, analyze, and mitigate, *inter alia*, the following:

- The greenhouse gas emissions from the exploration, development, production, transportation, and combustion of the oil and gas ultimately produced as a result of the lease sales under each alternative. Such analysis must include both CO₂ and non-CO₂ emissions (e.g., methane and black carbon) and should consider the entire lifecycle of oil and gas extracted from the NPR-A. Analysis must also include greenhouse gas emissions from the offshore oil and gas enabled by infrastructure on the NPR-A, and not be limited to greenhouse gas emissions produced by combustion engines used as part of development and exploration;
- The environmental, societal, social, economic, and health, consequences of the greenhouse gas emissions and consequent warming associated with the lease sales under each alternative;
- Climate change as a cumulative impact of the lease sales;

- Ocean acidification both as a cumulative impact of the lease sales and as an environmental baseline;
- The rapidly changing Arctic as an environmental consequence of the greenhouse emissions of the lease sales;
- Impacts of sea level rise and coastal erosion as a consequence of climate change and in conjunction with oil and gas development;
- Analysis of the sensitive species and habitats affected by the lease sales, including polar bears, bowhead whales, various ice seals, walruses, and other marine mammals, seabirds, fish, invertebrates, as well as terrestrial wildlife in the context of climate change and the lease sales' cumulative impacts;
- The legal context of the lease sales, including compliance with domestic law (National Environmental Policy Act (NEPA), Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA)) and international law (United Nations Framework Convention on Climate Change);
- A range of reasonable alternatives, including a viable no-action alternative that allows for no lease sales as a baseline;
- Alternatives to the proposed action alternatives, including an alternative that is consistent with the call put out by leading climate scientists and incorporated in several legislative proposals to reduce U.S. greenhouse gas emissions by 80 percent by 2050;
- Instead of Special Areas that as described by the BLM do not “impede oil and gas development” (NPR-A DEIS 2.4.4), permanent protection for all important ecological areas, including all protected areas in Alternative B with additional measures and protected areas added that preclude any and all lease sales or oil and gas exploration or development. Permanent protections would be established by Wilderness designation, establishment of wildlife refuges, and/or legislatively protected BLM areas;
- All necessary mitigation measures to reduce the direct and indirect impacts of the proposed action.

Further details on each of these issues, as well as background information on the impacts of global warming, the need to reduce greenhouse gas emissions, and the species directly and indirectly affected by the leasing authorized under the alternatives in the DEIS follows.¹

A. *The National Environmental Policy Act*

The National Environmental Policy Act (NEPA) is the “basic national charter for protection of the environment.” 40 C.F.R. § 1500.1(a). Congress intended NEPA to “encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation.” 42 U.S.C. § 4321.

¹ We also join in and incorporate by reference the critique of the DEIS contained in the coalition comment letter submitted by the Wilderness Society and other groups to the degree such comments are consistent with these.

To accomplish these goals, all federal agencies must assess the environmental impacts of their proposals before taking any action on them. The preparation of an Environmental Impact Statement (EIS) lies at the heart of NEPA, and must “provide full and fair discussion” of impacts such as greenhouse gas emissions and global warming implications and must “inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize” these impacts. 40 C.F.R. § 1502.1.

The purpose of the NEPA review process is two-fold: “First, it places upon [the action] agency the obligation to consider every significant aspect of the environmental impact of a proposed action. Second, it ensures that the agency will inform the public that it has indeed considered environmental concerns in its decisionmaking process.” *Kern v. United States Bureau of Land Management*, 284 F.3d 1062, 1066 (9th Cir. 2002). *See also Columbia Basin Protection Ass’n v. Schlesinger*, 643 F.2d 585, 592 (9th Cir. 1981) (“[T]he preparation of an EIS ensures that other officials, Congress, and the public can evaluate the environmental consequences independently.”).

These dual objectives require that environmental information be disseminated “early enough so that it can serve practically as an important contribution to the decisionmaking and will not be used to rationalize or justify decisions already made.” 40 C.F.R. § 1502.5. *See also Marsh v. Oregon Natural Resources Council*, 490 U.S. 360, 371 (1989) (“the broad dissemination mandated by NEPA permits the public and other government agencies to react to the effects of a proposed action at a meaningful time”); *Metcalf v. Daley*, 214 F. 3d 1135, 1143-44 (9th Cir. 2000). Ultimately, an EIS satisfies NEPA only if

“its form, content, and preparation substantially (1) provide decision-makers with an environmental disclosure sufficiently detailed to aid in the substantive decision whether to proceed with the project in light of its environmental consequences, and (2) make available to the public, information of the proposed project’s environmental impacts and encourage participation in the development of that information.”

Trout Unlimited v. Morton, 509 F.2d 1276, 1283 (9th Cir. 1974). Under NEPA, BLM must fully analyze the environmental impacts of oil and gas leasing in the NPR-A, including the greenhouse gas impacts of such leasing. The DEIS, however, is grossly inadequate in this regard.

B. Climate Change and Greenhouse Gas Emissions

The DEIS’s consideration of climate change and the impact it is having on the NPR-A ecosystem is woefully inadequate. The Arctic is experiencing a cascade of related impacts from climate change that are altering the nature and function of the ecosystem. In addition to atmospheric warming, greenhouse gas emissions are leading to warmer waters, increased frequency of extreme weather events, rapidly melting sea ice, sea level rise, coastal and lakeside erosion, ocean acidification, and increased tundra fires, all of which have negative impacts on the NPR-A environment and wildlife. Without considering these changes and how they will interact with the

proposed alternatives, BLM cannot make an informed decision about the relative impacts of the various alternatives. Although BLM makes some attempt to consider the greenhouse gases that will be directly produced by construction activities in the four alternatives, it does not consider the greenhouse gases that will be produced by the burning of the oil and gas extracted from lands on the NPR-A (i.e., the lifecycle of the oil and gas), or from the release of methane from melting permafrost and the seafloor. There is also no analysis of the greenhouse gas emissions that will be released by offshore oil and gas development that would be enabled by lease sales in the NPR-A. Nor does the DEIS address how impacts from the already-changing climate will act cumulatively with the proposed alternatives to affect the NPR-A ecosystem. This section provides detailed information on the scientific basis for human-caused climate change, and the important negative impacts climate change will have on the function and processes of ecosystems within the NPR-A.

The scientific information and discussion throughout this discussion of climate change will provide ample evidence that a modified Alternative B (here described as Alternative B+) that mandates permanent protection for all of the protected areas, and additional permanent protections for other ecologically important areas is by far the best alternative for preserving ecological functions and processes within the NPR-A in the context of a rapidly warming climate. Alternative B+ will best allow vulnerable species in the NPR-A to adapt to the drastic climatic changes they face, without additional and serious disturbances from oil and gas development and exploration activities. Alternative B+ should include measures that provide for permanent protections from oil and gas development and exploration for all designated Special Areas included in Alternative B. Additional protections and mitigation measures under Alternative B+ should be included to protect wildlife resources and habitat, especially because important habitat areas, such as the Teshukpek Lake area, will be inundated by sea level rise within this century (Hansen et al. 2006, Pritchard et al. 2009), forcing birds, caribou and other species that depend on this area for critical biological needs such as feeding, calving, or nesting, to relocate to inland habitat further south if they survive at all. By not including an environmentally protective alternative, such as the above described Alternative B+, the BLM fails to adequately consider the vast scientific evidence regarding climate change impacts to the NPR-A. This violates NEPA requirements to “make available to the public, information of the proposed project’s environmental impacts and encourage participation in the development of that information.” *Trout Unlimited v. Morton*, 509 F.2d 1276, 1283 (9th Cir. 1974).

1. Greenhouse Gas Emissions and Climate Change

The global average temperature has risen by approximately $0.74^{\circ}\text{C} \pm 0.18^{\circ}\text{C}$ ($1.33^{\circ}\text{F} \pm 0.32^{\circ}\text{F}$) during the past 100 years (1906-2005) (Trenberth et al. 2007). Important advances in the detection and attribution of global warming have demonstrated, beyond any legitimate scientific debate, that a significant portion of this observed warming is due to anthropogenic greenhouse gas emissions (Barnett et al. 2005, Trenberth et al. 2007).

Past anthropogenic greenhouse gas emissions have altered the energy balance of the earth by 0.85 ± 0.15 watts per square meter (Hansen et al. 2005). Due to the lag time in the climate

system, this energy imbalance commits the earth to additional warming of 0.6° C (1° F) that is already “in the pipeline,” even absent additional greenhouse gas emissions (Hansen et al. 2005).

Because greenhouse gas emissions are continuing to increase, warming is projected to accelerate. Based on differing scenarios of future greenhouse gas emissions and the world’s leading climate models, the IPCC has projected 1.1° C to 6.4° C (2° F to 11.5° F) of additional warming by the end of this century (Solomon et al. 2007). The higher the level of greenhouse gas emissions, the more the world will warm.

As scientific understanding of global warming has advanced, so too has the urgency of the warnings from scientists about the consequences of our greenhouse gas emissions. Scientists are now able to tell us, with a high degree of certainty, that additional warming of more than 1° C (1.8° F) above year 2000 levels will constitute “dangerous climate change,” with particular reference to sea level rise and species extinction (Hansen et al. 2006, Hansen et al. 2007). Furthermore, scientists are able to tell us the atmospheric greenhouse gas level “ceiling” that must not be exceeded in order to prevent additional warming of more than 1° C (1.8° F) above year 2000 levels (Hansen et al. 2006, Hansen et al. 2007). In turn, scientists can tell us the limitations that must be placed on greenhouse gas emissions to avoid exceeding this “ceiling” of approximately 450 ppm-475 ppm of carbon dioxide (Hansen et al. 2006).

In order to stay within the ceiling, emissions must follow the “alternative,” rather than the “business as usual” greenhouse gas emissions scenario (Hansen 2006, Hansen et al. 2006, Hansen et al. 2007). In the business as usual scenario, carbon dioxide emissions continue to grow at about 2 percent per year, and other greenhouse gases such as methane and nitrous oxide also continue to increase. In the alternative scenario, by contrast, carbon dioxide emissions decline moderately between now and 2050, and much more steeply after 2050, so that atmospheric carbon dioxide never exceeds 475 parts per million. The alternative scenario would limit global warming to less than an additional 1° C in this century (Hansen et al. 2006, Hansen et al. 2007).

Since the year 2000, however, society has not followed the alternative scenario. Instead, carbon dioxide emissions have continued to increase by 2 percent per year since 2000 (Hansen et al. 2006, Hansen et al. 2007). This rate of increase itself appears to be increasing (Denman et al. 2007). If this growth continues for just ten more years, the 35 percent increase in carbon dioxide emissions between 2000 and 2015 will make it impractical if not impossible to achieve the alternative scenario (Hansen et al. 2006, Hansen et al. 2007). Moreover, the “tripwire” between keeping global warming to less than 1° C, as opposed to having a warming that approaches the range of 2° C to 3° C, may depend upon a relatively small difference in anthropogenic greenhouse gas emissions (Hansen et al. 2006, Hansen et al. 2007). This is because warming of greater than 1° C may induce positive climate feedbacks, such as the release of large amounts of methane from thawing arctic permafrost, that will further amplify the warming (Hansen et al. 2006, Hansen et al. 2007).

Just ten more years on current greenhouse gas emissions trajectories will essentially commit us to climate disaster. Dr. James E. Hansen, Director of the NASA Goddard Institute for Space Studies, and NASA’s top climate scientist, has stated:

“In my opinion there is no significant doubt (probability > 99 percent) that . . . additional global warming of 2° C would push the earth beyond the tipping point and cause dramatic climate impacts including eventual sea level rise of at least several meters, extermination of a substantial fraction of the animal and plant species on the planet, and major regional climate disruptions”

(Hansen 2006:30).

Studies that have used climate model projections to forecast species extinctions have predicted large species losses. Using a mid-range climate scenario, Thomas et al. (2004) predicted that 15 percent to 37 percent of species are already committed to extinction by 2050. Malcolm et al. (2006) estimated that 11 percent to 43 percent of endemic species in biodiversity hotspots will go extinct by the end of the century under a scenario of doubled carbon dioxide concentrations, which includes an average of 56,000 endemic plants and 3,700 endemic vertebrate species.

In order to avoid truly unacceptable consequences of global warming, we must stop the growth of greenhouse gas emissions, and, in relatively short order, begin reducing them. Achieving the reductions necessary to keep additional global warming between the years 2000-2100 within 1° C will be extremely challenging, and will require deep reductions in emissions from industrialized nations such as the United States. Until and unless the United States has adopted and begun to implement an effective and rational plan to reduce such emissions, we should not commit to further greenhouse gas emissions through additional oil and gas development.

2. Important Greenhouse gases

In addition to the documented impacts of CO₂ on the climate, there are additional important greenhouse gases contributing to climate change, that are especially relevant to the Arctic ecosystem and must be analyzed in more detail in the FEIS.

i. Methane

Methane release from natural and manmade sources due to the impacts from global climate change and from direct release and impacts due to oil and gas development and production may contribute a significant amount of greenhouse gas emissions to the atmosphere, and must be considered in the FEIS. Methane is a potent greenhouse gas and has contributed the second largest anthropogenic radiative forcing since pre-industrial times. Methane is a more effective greenhouse gas than CO₂ on a per molecule basis, and has the potential to contribute as much carbon to the atmosphere as fossil fuel emissions (Archer et al. 2007). Over a 100-year period, methane will trap about 23 times more heat than an equal amount of carbon dioxide (Albritton et al. 2001).

Since the industrial revolution, rapid increases in human activity have led to more than a doubling of atmospheric methane concentrations (Wuebbles and Hayhoe 2002). As a result of

human activities the atmospheric concentration of methane has increased by about 150 percent since 1750, continues to increase, and the current concentration of atmospheric methane has not been exceeded during the past 650,000 years (Forster et al. 2007). Anthropogenic sources account for about two thirds of emitted methane and include coal and gas production, agriculture, biomass burning, landfills, and animals (Quinn et al. 2007). There is also evidence that current carbon monoxide (CO) emissions are a cause of increasing methane concentrations (Denman et al. 2007). Both terrestrial and marine sources of methane gas release within the NPR-A have the potential to be significant contributors of greenhouse gases to the atmosphere, and rate of release is directly related to climate change impacts. Release of methane provides a feedback mechanism in conjunction with climate change, further contributing to global warming. As such, the complete lack of discussion in the DEIS of methane release and its contribution to climate change and how this may directly impact the NPR-A ecosystem is a huge oversight, which must be amended in the FEIS.

A warming climate can lead to the release of methane in terrestrial and marine areas, especially at northern latitudes. In the Arctic, measurements indicate that methane emissions are increasing due to higher temperatures and the resulting disappearance of permafrost and wetter soil conditions (Zimov et al. 2006). In regions of continuous permafrost, such as the NPR-A, global warming has resulted in a degradation of the permafrost and an increase in the size and number of thaw lakes. It has been estimated that this increase in lake area has led to a 58 percent increase in methane emissions (Walter et al. 2006). As discussed in detail below methane may be released through a variety of climate change and oil and gas development mechanisms, including release of methane hydrates from thawing permafrost or seafloor sources due to increased surface temperatures, release of organic matter from thawing permafrost, and release of natural gas from pipelines or other commercial operations.

Methane frozen into hydrate is found in vast reservoirs below the sea floor and in permafrost soils along the Arctic coastline (Archer et al. 2007). Methane hydrates are approximately 164 times more concentrated than methane gas, thus a small volume of methane hydrate could liberate large volumes of gas and contribute substantial amounts of greenhouse gas to the atmosphere (Ruppel 2009). In fact, the global hydrate reservoir is so large that if just 10 percent of the methane contained in this reserve were released in the next few years, the impact on the earth's radiation budget would be equivalent to a 10-fold increase in atmospheric CO₂ (Archer et al. 2007). Global warming effects have been found to destabilize these methane hydrates causing a release of methane into the water column and atmosphere (Biajstoch et al. 2011). Climate change will likely release methane stored in Arctic areas first, as the Arctic Ocean is expected to warm earlier than other ocean areas, partly because of albedo feedback from the melting Arctic ice cap. Release of methane hydrate deposits may also be triggered by deep-ocean warming or by submarine landslide, both of which are linked to warmer surface temperatures (Archer et al. 2007). Methane releasing from hydrates found under the seafloor often bubbles to the ocean surface, and is then added to the atmosphere (Archer et al. 2007). Methane that does not release to the surface is oxidized to CO₂ in seawater, further contributing to ocean acidification processes.

In terrestrial areas, recent studies have found large surface leaks of methane gas to the atmosphere from the Alaskan Arctic (Walter Anthony et al. 2012). These leaks are likely to

increase with global warming because current observations show that methane is escaping along the boundaries of permafrost thaw and receding glaciers, which are becoming more prevalent as temperatures increase at northern latitudes (Walter Anthony et al. 2012). With a carbon store of over 1,200 Pg (10^{15} grams), the methane reservoir in the Arctic is huge when compared with the global atmospheric methane pool of just 5 Pg (Walter Anthony et al. 2012).

In addition to release of methane hydrates, organic matter locked in frozen permafrost may add a substantial amount of methane to the atmosphere. If 20 percent of the peat reservoir in permafrost is converted to methane and released over the next 100 years, this would double the atmospheric methane concentration by releasing 0.7 billion tons of carbon per year. Leakage of methane gas from climate change induced permafrost melting will be significant within and nearby the NPR-A. Some of the most intense melting is already occurring along the Arctic Ocean (Nelson et al. 2002). Erosion of thermokarst lake edges and coastal erosion, both driven by climate change, also drive permafrost melting, and subsequent release of methane from permafrost. In parts of Alaska the coast is receding at rates of tens of meters per year (Jones et al. 2009). Leakage of methane from inland sources could thus have significant impacts on total greenhouse gas emissions and further contribute to climate warming.

The DEIS fails to consider direct anthropogenic leakage of natural gas. The FEIS should consider the impacts of methane gas emissions from gas development and extraction over the entire lifetime of the natural gas, and should also consider the impacts of oil and gas development on hydrology and permafrost and associated release of methane. In its brief and incomplete analysis in the DEIS, the BLM states that, “[w]hile it is not possible to know with confidence the impact of increased greenhouse gas emissions due to proposed operations within the planning area on global climate change, it is certain that it would contribute a very small amount to climate change” (DEIS 4.3.1.2). This analysis is inadequate in that not only does it not consider methane emissions from the direct development of natural gas, but it also does not even mention the impacts of oil and gas development on permafrost melting, erosion, and resulting methane release from permafrost or ocean sediment. Nor does the DEIS analyze the total contribution of oil and gas development in the NPR-A and oil and gas development offshore to worldwide greenhouse gas emissions, and their impact on permafrost melting and methane release.

The FEIS must include detailed analyses of the estimated methane emissions under each alternative, including methane that would be released from the permafrost and submarine deposits, and associated impacts on the Arctic ecosystem through contribution to greenhouse gas emissions and climate change. Analysis must include direct impacts from oil and gas extraction on NPR-A land, as well as impacts from offshore oil and gas extraction that would be enabled by infrastructure on the NPR-A. Additionally, analysis must include methane releases due to climate change caused melting sea ice, submarine landslide, and permafrost. The current analysis is flawed and incomplete, and severely underestimates methane emissions that will occur as a direct or indirect result of each alternative. As a result, the analysis in the DEIS does not fulfill NEPA requirements.

ii. Tropospheric ozone

Ozone functions both as a direct greenhouse gas, and as a controller of greenhouse gas lifetimes. It is thought to have caused around one third of all the direct greenhouse gas-induced warming since the industrial revolution. Modeling and studies provide evidence that tropospheric ozone concentrations have increased since pre-industrial times due to increases in emissions of anthropogenic ozone precursors, especially methane (Oltmans et al. 1998). Ozone that is produced in the northern hemisphere and mid-latitudes is most efficiently transported to the Arctic in the non-summer months. Local sources of ozone and its precursors in the Arctic and NPR-A region include marine vessel emissions, emissions from fossil fuel burning, oil and gas related support equipment, emissions from methane hydrates and releases of methane from permafrost, and emissions from gas pipelines infrastructure. Shipping emissions in the Arctic contribute directly to ozone levels, and have the potential to increase Arctic ozone levels by a factor of two or three relative to present day (Quinn et al. 2007).

Subarctic and Arctic ozone precursor emissions may be increasing as climate change causes boreal regions to warm, resulting in an increased frequency of fires in boreal areas (Kasischke et al. 2005). Fires emit large quantities of CO and non-methane volatile organic carbon (NMVOC) compounds which may combine with anthropogenic emissions in the same region to produce large amounts of ozone (Quinn et al. 2007). CO emissions from boreal fires in the spring and summer of 2003 made a substantial impact on ozone concentrations in the Arctic (Generoso et al. 2007). The projected increase in temperature and increased shrubbiness in tundra ecosystems, including that of the NPR-A, is predicted to increase fire frequency, severity and extent (SNAP 2011, Higuera et al. 2008).

Fire frequencies in the interior of Alaska are projected to be more strongly influenced by changes in vegetation patterns, which may significantly contribute to pollution levels in Arctic areas such as the NPR-A. For example, in April and May of 2006, record high concentrations of ozone were measured at the Zeppelin research station in Spitsbergen (Stohl et al. 2007). This severe air pollution episode was due to a combination of unusually high temperatures in the European Arctic and large emissions from agricultural fires in Belarus, Ukraine and Russia. As the warming of the Arctic continues to proceed more quickly than that of lower latitudes, transport of pollutants from interior Alaska or sub-arctic regions may become more frequent in the future, resulting in increased tropospheric ozone concentrations and a further increase in surface temperatures, creating a feedback mechanism (Quinn et al. 2007).

The DEIS fails to analyze the cumulative impacts from increased shipping activity, fire, permafrost melting, and release of methane from methane hydrate source, and from oil and gas extraction on tropospheric ozone concentrations and the resulting increase in climate warming and impact on wildlife and ecosystems of the NPR-A. Such analysis must be included in the FEIS and analyzed thoroughly for each alternative.

iii. Black Carbon

Black carbon is a significant contributor to Arctic warming that is not adequately considered in the DEIS. Black carbon, or soot, consists of particles or aerosols released through the inefficient burning of fossil fuels, biofuels, and biomass (Quinn et al. 2007). Unlike greenhouse gases, which warm the atmosphere by absorbing longwave infrared radiation, soot has a warming impact because it absorbs shortwave radiation, or visible light (Chameides and Bergin 2002). Black carbon is an extremely powerful greenhouse pollutant. Scientists have described the average global warming potential of black carbon as about 500 times that of carbon dioxide over a 100-year period (Hansen et al. 2007, Reddy and Boucher 2007). This powerful warming impact is remarkable given that black carbon remains in the atmosphere for only about four to seven days, with a mean residence time of 5.3 days (Reddy and Boucher 2007).

Black carbon contributes to Arctic warming through the formation of “Arctic haze” and through deposition on snow and ice, which increases heat absorption (Quinn et al. 2007; Reddy and Boucher 2007). Arctic haze results from a number of aerosols in addition to black carbon, including sulfate and nitrate (Quinn et al. 2007). The effects of Arctic haze may be to either increase or decrease warming, but when the haze contains high amounts of soot, it absorbs incoming solar radiation and leads to heating (Quinn et al. 2007).

Soot also contributes to heating when it is deposited on snow because it reduces the reflectivity of the white snow and instead tends to absorb radiation. A recent study indicates that the direct warming effect of black carbon on snow can be three times as strong as that due to carbon dioxide during springtime in the Arctic (Flanner 2007). Black carbon emissions that occur in or near the Arctic contribute the most to the melting of the far north (Reddy and Boucher 2007; Quinn et al. 2007).

Reductions in black carbon therefore provide an extremely important opportunity to slow Arctic warming in the short term, and mitigation strategies should focus on within-Arctic sources and northern hemisphere sources that are transported by air currents most efficiently to the Arctic. Conversely, allowing black carbon emissions to increase in the Arctic as the result of oil and gas development, increased shipping, or other industrial activity will accelerate Arctic warming and consequent loss of tundra ponds and the seasonal sea ice, contributing to the extinction of the polar bear and other species. Black carbon reductions will also provide air quality and human health benefits. Numerous direct and indirect impacts of the leasing proposed under the alternatives of the DEIS will result in substantial releases of black carbon in the Arctic. This factor is not considered in the DEIS, and must be thoroughly analyzed for each alternative in the FEIS.

3. Climate Change Impacts to the NPR-A

The rising temperatures in Alaska have significant repercussions for the species and resources of the NPR-A. In addition to atmospheric warming, greenhouse gas emissions are leading to warmer waters, sea level rise, rapidly melting sea ice, increased frequency of extreme weather

events, increasing ocean acidification, and higher incidence of tundra fires, all of which have negative impacts on the NPR-A environment and wildlife. Without considering these changes and how they will interact with the proposed alternatives, the BLM cannot make an informed decision about the relative impacts of the various alternatives.

Climate change and ocean acidification represent significant long-term threats to the survival of many of the species in the NPR-A. Climate change is affecting the far northern latitudes at a greater rate than the rest of the world. Over the past 50 years Alaska has warmed at more than twice the rate of the rest of the United States' average (USGCRP 2009). Annual average temperature in Alaska has increased 1.9°C, while winters have warmed by 3.5°C, which has contributed to earlier spring snowmelt, sea-ice loss, widespread glacier retreat, and permafrost warming (USGCRP 2009). This trend is expected to continue. Alaska's annual temperatures are projected to rise by an average of 4.5°C by the end of the century (range: 3°C -7.4°C) under a mid-level emissions scenario (Christensen et al. 2007: Table 11.1). These temperature changes will result in a variety of impacts to the vegetation and wildlife in the NPR-A.

As the following discussion of specific impacts of climate change in the NPR-A demonstrates, climate change is already impacting, and will continue to impact key species and resources of the NPR-A. Such changes are likely to lead to a reduction of available breeding habitat and prey for the threatened, endangered and sensitive species of the NPR-A, compromising their chances of survival and recovery. As the effects of global warming increase over the foreseeable future, these impacts will become all the more severe.

i. Sea Level Rise and Coastal Erosion

The climate change analysis conducted by Scenarios Network for Alaska and Arctic Planning (SNAP), for this DEIS, completely fails to include sea level rise or coastal erosion in its assessment. This failure to analyze sea level rise and coastal erosion is a major gap in the BLM's analysis of environmental impacts. The DEIS does briefly mention sea level rise during discussion of the impacts of climate change in the Affected Environment section, but does not analyze the effects of sea level rise in the context of oil and gas exploration and development in Environmental Consequences. Impacts from coastal erosion and sea level rise include a reduced terrestrial area, degradation of wildlife habitat, and direct impacts to construction and activities related to oil and gas exploration and extraction that may require changes in the location of development or additional mitigation measures. Erosion and inundation of freshwater ponds with brackish water will further degrade wildlife habitat. Decreases and degradation of wildlife habitat on the coastal plain from coastal erosion and sea level rise will adversely impact many wildlife species, including special status species, which use these plains as breeding, nesting, and feeding grounds. The FEIS must analyze impacts from coastal erosion and sea level rise in regards to wildlife habitat and combined with cumulative impacts from oil and gas development. The FEIS must also consider sea level rise and coastal erosion in regards to its impact on oil and gas infrastructure. Structures may become inundated by sea water, undermined by erosion, or rendered unstable by slumping and changes in soil stability.

Sea level rise in many regions of the Arctic is advancing much faster than the global average, with particularly rapid increases in sea level occurring in recent years (Richter-Menge et al. 2007). Although the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report projected a global mean sea-level rise in the 21st century of 18 cm – 59 cm, the IPCC acknowledged that this estimate did not represent a “best estimate” or “upper bound” for sea-level rise because it assumed a negligible contribution from the melting of the Greenland and west Antarctic ice sheets (IPCC 2007: 45). Recent studies documenting the accelerating ice discharge from the Greenland and Antarctic ice sheets indicate that the IPCC projections are a substantial underestimate (Hansen et al. 2006, Pritchard et al. 2009). Recent studies that have attempted to improve upon the IPCC estimates have found that a mean global sea level rise of at least one to two meters is highly likely within this century (Rahmstorf 2007, Pfeffer et al. 2008, Vermeer and Rahmstorf 2009, Grinsted et al. 2010, Jevrejeva et al. 2010). Studies that have reconstructed sea-level rise based on the geological record, including oxygen isotope and coral records, have found that larger rates of sea-level rise of 2.4 m to 4 m per century are possible (Milne et al. 2009). This map illustrates that a large portion of the important wildlife habitat of the coastal plain would be inundated under a four-meter sea level rise scenario. Critically, Teshekpuk Lake would be under sea water if this amount of sea level rise occurred. Therefore, protections of wildlife areas in the FEIS must take into consideration this predictable future loss of coastal plain, which could occur within the next 50 years, and include permanent protections for upland wildlife areas.

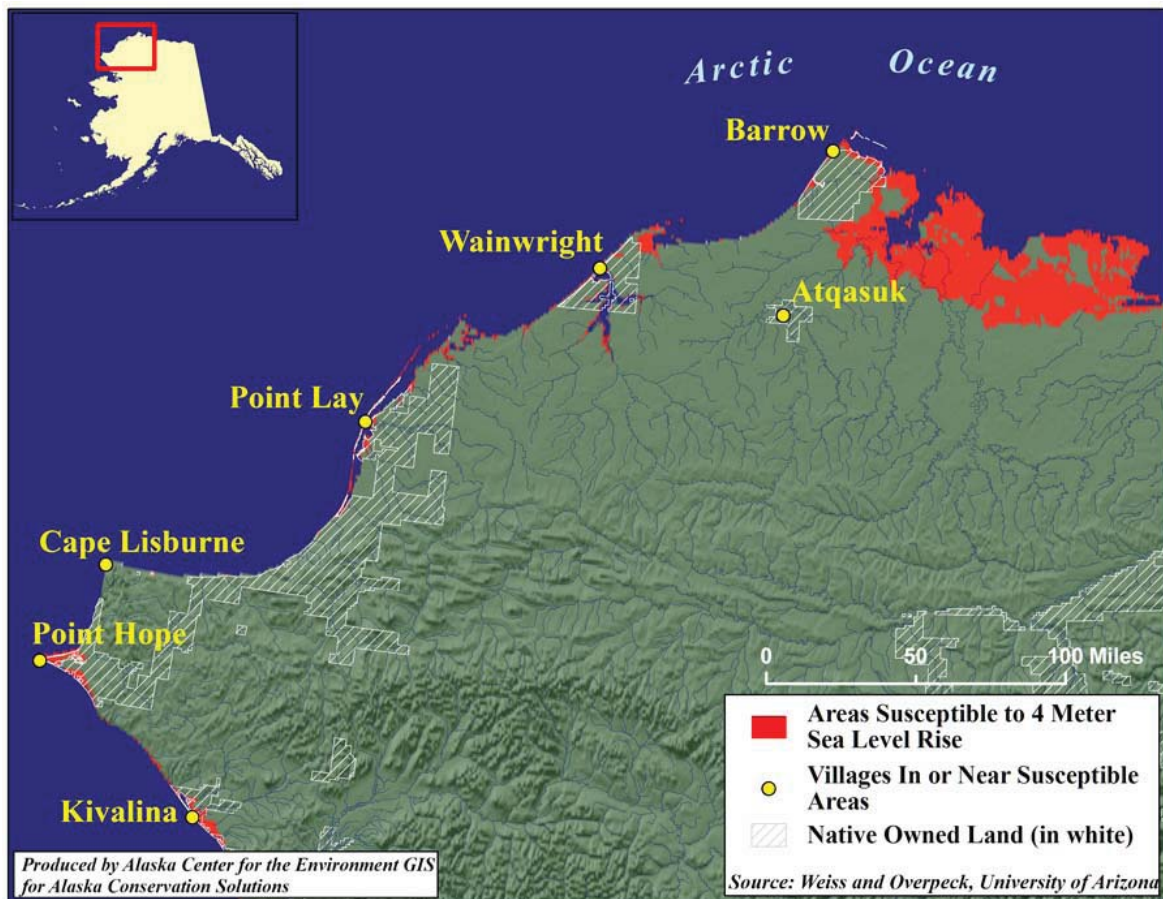


Figure 1. Areas susceptible to a 4 meter sea level rise in the NPR-A and North Slope of Alaska. Source: Weiss and Overpeck, University of Alaska. Produced by Alaska Center for the Environment GIS for Alaska Conservation Solutions. Available at: <http://northern.org/media-library/maps/arctic/arctic-climate-change-impacts-maps/GWSeaLevelRiseWestWEB1g.jpg/view>

In addition to sea level rise, Arctic shorelines are eroding at an accelerated rate due to the combined effects of sea-ice loss, increasing sea surface temperatures, increasing terrestrial permafrost degradation, rising sea levels, and increases in storm power and corresponding wave action (Jones et al. 2009). Increasing coastal erosion jeopardizes species such as the polar bear, caribou, walrus, seabirds and waterfowl that use coastal habitats within the NPR-A. Sea level rise is an especially important consideration in the northern portion of the NPR-A, where there is a vast array of wildlife, and the coastal plains are especially low-lying.

A recent published study documented a doubling of coastal erosion rates in the Teshekpuk Lake area. Mars et al. (2007) concluded that “most of this additional land loss is attributed to the breaching of thermokarst lakes by coastal erosion and the subsequent flooding of those thermokarst depressions by marine water.” Such loss of pond habitat is consistent with global warming:

the results are consistent with climate change trends that have resulted in warming of permafrost and shrinking summer pack ice in the Arctic Ocean. The former would render permafrost coastal bluffs and inland lakeshores more susceptible to erosion by waves and headward erosion of ephemeral streams, respectively, and the latter would increase wave fetch and contribute to more intense summer storms.

(Mars et al. 2007).

Another study documented a different climate-related dynamic that also results in the loss of waterbird breeding ponds such as those in the NPR-A. Smol et al. (2007) document the loss of Arctic ponds from desiccation in a warming climate. The effects on the ecosystem, and the eiders and loons dependant on that ecosystem are likely to be severe:

A key “tipping point” has now been passed: Arctic ponds that were permanent water bodies for millennia are now ephemeral. The ecological ramifications of these changes are likely severe, and will cascade throughout the Arctic ecosystem (e.g., waterfowl habitat and breeding grounds, invertebrate population dynamics and food for insectivores, drinking water for animals, etc.). Furthermore, lower water levels will have many indirect environmental effects, such as further concentration of pollutants. Ironically, high Arctic ponds, which are such important bellwethers of environmental change, are now disappearing because of climatic warming.

(Smol et al. 2007).

Such accelerated erosion represents a significant threat to the species and resources of the NPR-A that should have been evaluated in the DEIS. For example, the DEIS states that erosion along the Beaufort Sea coast and the shore of Teshekpuk Lake required a series of winter mobilizations to plug and abandon four wells (NPR-A DEIS 4.7.3.1). With scientifically based predictions of increases in coastal erosion and erosion of inland lakeshores, such incidents of erosion undermining oil and gas equipment are likely to become commonplace, with accompanied safety and spill issues. The FEIS must include analysis of these impacts and specific mitigation measures to limit the contributing impact oil and gas development may have on coastal and inland lakeshore erosion.

The DEIS must also include sea level rise and coastal erosion in its impact analyses and stipulations for best management practices. Inundation by seawater, and coastal erosion would have major impacts under all alternatives, and would be exacerbated by oil and gas development on the coastal plain. Additionally, the cumulative impacts from greenhouse gas emissions from the oil and gas throughout its lifecycle, and contribution to climate warming and sea level rise in the Arctic, must be included in analysis.

ii. Melting Sea Ice

Climate change is dramatically affecting sea ice in the Arctic, an important habitat element for many animals in the NPR-A. The lowest summer sea ice minimum on record was reached on September 16, 2007. The record low of 4.13 million square kilometers (1.59 million square miles) was far less than the previous record low of 5.32 million square kilometers (2.05 million square miles) in 2005 (NSIDC 2007). The last five years (2007-2011) have been the five lowest summer sea ice minima on record. Sea ice extent is important for a variety of animals in the NPR-A and adjacent waters, including polar bears and ice seals. The EIS must thoroughly analyze the impacts to these species of losing their sea ice habitat.

iii. Ocean Acidification

The oceans are acidifying at an alarming rate, with particularly profound impacts in Northern waters. The world's oceans are an important part of the planet's carbon cycle, absorbing large volumes of carbon dioxide and cycling it through various chemical, biological, and hydrological processes. The oceans have thus far absorbed approximately 30 percent of the anthropogenic carbon dioxide emitted since the beginning of the industrial revolution (Feely et al. 2004). A primary impact of ocean acidification is that it depletes seawater of the carbonate compounds aragonite and calcite that many marine creatures need to build shells and skeletons (Orr et al. 2005, Fabry et al. 2008, Feely et al. 2009). As a result, ocean acidification hinders organisms such as corals, crabs, seastars, sea urchins, and plankton from building the protective armor they need to survive. Rising acidity also affects the basic functions of fish, squid, invertebrates, and other marine species and has detrimental effects on metabolism, respiration and photosynthesis, which can thwart growth and lead to higher mortality (Fabry et al. 2008). Because of its serious impacts to so many species, ocean acidification threatens to disrupt the entire marine food web.

Furthermore, an ever-growing body of scientific studies indicates that ocean acidification is affecting the Arctic more rapidly and is profoundly altering Arctic waters. The scientific evidence is as follows: (1) ocean acidification is a predictable consequence of rising atmospheric CO₂ (Feely et al. 2009); (2) the waters of the high-latitude Pacific-Arctic region are among the most vulnerable to ocean acidification because mixing and lower temperatures create conditions with lower pH and saturation state values (Fabry et al. 2009, Mathis 2011); (3) seasonal aragonite undersaturation is already occurring in the Bering Sea (Fabry et al. 2009, Mathis 2011, Mathis et al. 2011 a,b); (4) a variety of species, including fish, squid and crustaceans are negatively impacted by ocean acidification in laboratory experiments at acidification levels expected in this century (Fabry et al. 2008, Guinotte et al. 2008); and (5) ocean acidification is irreversible for tens of thousands of years after emissions cease (Richardson et al. 2009).

The first obvious declines will affect the especially vulnerable planktonic species, foraminifera and pteropods, which form calcium carbonate shells in the form of aragonite and have been found to be susceptible to increased ocean acidification, and the resulting undersaturation of the forms of calcium carbonate required to form their exoskeletons. These planktonic species are abundant in Alaskan waters and form the basis of the marine food chain. Reductions in the production of planktonic species due to increased CO₂ emissions and resulting ocean acidification processes could negatively impact all species in the marine food chain, including salmon, other fish species, coral, whales, seals, walruses, polar bears, and other Alaska wildlife species.

When burned for heat or energy, natural gas and oil produce vast amounts of CO₂, which contribute to ocean acidification. The FEIS must include analysis of contributions to ocean acidification from the entire lifecycle of oil and gas development in the NPR-A, and from offshore oil and gas development enabled by infrastructure on the NPR-A. Ocean acidification will have profound impacts on the Arctic marine food chain. These impacts from climate change and acidification are not speculative or in the distant future; they are happening now. Virtually no species in the NPR-A will be unaffected over the coming decades.

iv. Changing climate and fire dynamics

Tundra burning impacts vegetation composition, nutrient cycling, and permafrost, and is an important feedback mechanism linking CO₂-induced climate warming to Arctic environmental change (Mack et al. 2011, Higuera et al. 2011). Tundra fires may also impact subsistence resources, including caribou populations (Joly et al. 2010). There is increasing evidence linking Arctic warming and loss of sea ice to tundra fire regimes. In 2010 the largest number of fires on record occurred in the Noatak National Preserve, which is located just south of the NPR-A, above the Arctic Circle by the Brooks Range in Northern Alaska (Hu et al. 2010, Higuera et al. 2011). As climate warming trends continue, it is expected that tundra fires will increase north of this area, including the NPR-A.

A warming climate will cause rapid permafrost degradation (Lawrence et al. 2006), enhance drainage in upland tundra ecosystems, and increase shrub cover, further exacerbating susceptibility of tundra to late season fires (Higuera et al. 2008, Hu et al. 2010). Recent studies have demonstrated the direct biological and physical impacts of tundra fires on arctic ecosystems

(Liljedahl et al. 2007). Notably, studies find that the rare incidence of large and severe fires in the tundra biome has been an important contributing factor to the role of tundra ecosystems as a major carbon sink over ecological history (Zimov et al. 2006). As tundra fires increase, there will be an associated release of soil carbon, which may alter the role of tundra ecosystem in the global carbon cycle (Hu et al. 2010). As a result, the tundra ecosystem may no longer function as a CO₂ sink and instead become a CO₂ source, as stored CO₂ is released.

The DEIS fails to properly analyze the significant role fire may play on the future ecological conditions in the NPR-A, and the impacts these changing conditions may have on wildlife species, especially those dependent on lichens as a food source. The SNAP analysis used as a basis for the DEIS estimates a slight increase in fire probability by 2100, and the Affected Environment section includes fire as a serious threat to terrestrial mammals, but this analysis fails to include the risks of increased fires in interior Alaska and resulting increased air pollution in the Arctic, and also fails to accurately project the future risk of fire due to sea ice melt and drying of the tundra ecosystem. Thus, tundra and boreal forest burning impacts are not adequately assessed in the Environmental Consequences section. Additionally, increased fire intensity and frequency in the NPR-A land area itself will intensify oil and gas development's impacts on permafrost, vegetation, and wildlife, and alter the CO₂ feedbacks, resulting in a substantially increased release of greenhouse gases. The impact of increased greenhouse gases, especially methane, related to tundra and boreal burning must be analyzed in the FEIS.

4. Economic Costs of Greenhouse Gas Emissions Must Be Considered

In its NEPA analysis, BLM should have evaluated the economic costs of greenhouse gas emissions from both the exploration and extraction activities as well as the consumption of the produced oil and gas. Important peer-reviewed literature exists on estimating the social costs of climate change and quantifying the cost of carbon dioxide emissions (Stern 2006). As this field has developed, the methodology and inclusiveness of economic studies has improved. At the same time, the scientific understanding of global warming impacts and predictive ability has also improved. The result is that the estimated cost of greenhouse gas emissions in the literature has increased steadily, and we now know that the cost of continued greenhouse gas emission trajectories would be astronomical (Stern 2006). While monetizing the impact of greenhouse gas emissions cannot substitute for a full discussion of all impacts under NEPA, an estimate of the economic costs should be included.

Researchers have concluded that \$73/tc² (year 2010) is a reasonable figure for decision makers to use as a lower benchmark of the economic cost of greenhouse gas emissions, but this figure rises sharply over time (Downing et al. 2005). An upper benchmark is more difficult to deduce from the current literature, but the risk of higher values for the social cost of carbon is significant (Downing et al. 2005, Watkiss et al. 2005). One widely respected report commissioned for the British government recommended that decision makers use the range of values displayed in Table 1.

² tc tonne carbon 3.664 tons of carbon dioxide.

Table 1: Economic Cost of Carbon: Values for Use in Project Appraisal (USD per ton carbon) (Source: Adapted from Watkiss et al. 2005:ix)³

Year of Emission	Central Guidance	Lower Central Estimate	Upper Central Estimate
2000	\$101	\$64	\$238
2010	\$119	\$73	\$293
2020	\$146	\$91	\$375
2030	\$183	\$119	\$475
2040	\$256	\$165	\$603
2050	\$384	\$238	\$768

The Stern Review of the Economics of Climate Change, another comprehensive report commissioned by the British government, recently concluded that allowing current emissions trajectories to continue unabated would eventually cost the global economy between five and 20 percent of GDP each year within a decade, or up to \$7 trillion, and warned that these figures should be considered conservative estimates (Stern 2006). By contrast, measures to mitigate global warming by reducing emissions were estimated to cost about one percent of global GDP each year (Stern 2006). The DEIS's utter failure to look at the economic costs of the greenhouse gas emissions generated by the various alternatives violates NEPA. This analysis must be included in the FEIS. Analysis must calculate estimated GHG emissions by alternative, based on the above discussion of GHGs and using a full life-cycle estimate of emission produced from any oil and gas produced at NPR-A and related sites (e.g., offshore development).

C. Impacts on wildlife

The actions considered under the DEIS will have significant direct and cumulative impacts on wildlife in the NPR-A, including many species of birds, caribou, wolverine, polar bears, ice seals, and walruses. The DEIS's treatment of this issue is inadequate. The proposed lease sales under all alternatives in the DEIS and the resultant greenhouse gas emissions are consistent with the business as usual scenario that will lead to polar bear, ice seal and walrus extinction (Hansen et al. 2006, Hansen et al. 2007). Just ten more years on current greenhouse gas emissions trajectories will essentially commit us to climate disaster that will impact not just sea-ice dependent species, but all Arctic wildlife. GHG emissions and climate change will result in widespread changes to the ecosystem dynamic of the NPR-A, changing vegetation, seasonal timing, and precipitation patterns. Ocean acidification will impact important calcifying plankton at the base of the Arctic marine food web, with widespread repercussions on marine life, including seabirds. In the FEIS, the BLM must analyze not just the direct impacts of oil and gas leasing in the NPR-A and subsequent exploration, development and production, on wildlife, but also the greenhouse emissions of the oil and gas produced from these sales. Also, the FEIS must include

³ Figures from Watkiss et al. 2005:ix were converted from GBP (£) to USD (\$) with the exchange rate calculator at http://coinmill.com/GBP_USD.html on July 18, 2006 and rounded to the nearest dollar.

analysis of the cumulative impacts of climate change on species, broken down by each alternative and taking into account the lease sales' impact on greenhouse gas emissions and global climate change. The rising temperatures in Alaska have significant repercussions for the species and resources of the NPR-A. Major impacts will occur within the next 50 years for most Arctic species, and this must be included in the FEIS analysis.

1. Endangered Species Act

Section 7 of the ESA requires that BLM consult with the appropriate wildlife services agencies to ensure that the lease sales do not jeopardize threatened or endangered species or adversely modify their critical habitat. 16 U.S.C. § 1536(a)(2). Section 7 consultation is required for “any action [that] may affect listed species or critical habitat.” 50 C.F.R. § 402.14. Agency “action” is defined in the ESA’s implementing regulations to include

all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas. Examples include, but are not limited to: (a) actions intended to conserve listed species or their habitat; (b) the promulgation of regulations; (c) the granting of licenses, contracts, leases, easements, rights-of-way, permits, or grants-in-aid; or (d) actions directly or indirectly causing modifications to the land, water, or air.

50 C.F.R. § 402.02. *See also Pacific Rivers Council v. Thomas*, 30 F.3d 1050, 1054-55 (9th Cir. 1994), *cert. denied*, 514 U.S. 1082 (1995) (recognizing that Congress intended “agency action” to be interpreted broadly, admitting of no limitations).

When a proposed action may affect a protected species, consultation must occur and be completed *before* the federal action may take place. *Pacific Rivers*, 30 F.3d at 1056; *Thomas v. Peterson*, 753 F.2d 754, 764-65 (9th Cir. 1985). The action agency consults with the appropriate wildlife agency. The National Marine Fisheries Service (NMFS) has primary responsibility for administering the ESA with regards to most marine species, including whales and most marine mammals, while the U.S. Fish and Wildlife Service (FWS) has responsibility for terrestrial species, as well as some marine mammals, and all seabirds. During the course of consultation, NMFS or FWS may “suggest modifications” to the action to “avoid the likelihood of adverse effects” to the listed species. 50 C.F.R. § 402.13. At the completion of consultation, NMFS or FWS issues a Biological Opinion (BO) that determines if the agency action is likely to jeopardize the species. *See* 50 C.F.R. § 402.02. If so, the agency may not proceed with any program, permit, or decision that would jeopardize a species’ survival unless the BO specifies reasonable and prudent alternatives that will avoid jeopardy and allow the agency to proceed with the action. 16 U.S.C. § 1536(b). *See also Sierra Club v. Marsh*, 816 F.2d 1376, 1384-86 (9th Cir. 1987) (enjoining highway construction because agency could not meet burden of absolute assurance that mitigation required to avoid jeopardy was possible).

Although procedural, consultation is the backbone of the ESA. As the Ninth Circuit recognized, “[o]nly by requiring substantial compliance with the act’s procedures can we effectuate” congressional intent to protect species. *Sierra Club v. Marsh*, 816 F.2d at 1384 (9th Cir. 1987).

The opening up of any areas of the NPR-A to oil and gas lease sales affects ESA-listed species. Numerous listed species inhabit the NPR-A and adjacent waters. These include the bowhead whale, humpback whale, fin whale, polar bear, and spectacled and Steller’s eiders. Additionally, the ringed seal, bearded seal, Pacific walrus, yellow-billed loon and the Kittlitz’s murrelet have been petitioned for listing and are likely to be listed during the implementation of the proposed lease sales. Moreover, these species as well as other listed species are vulnerable to global warming, and therefore the greenhouse gas emissions of the leases may affect species. BLM must complete consultation with NMFS and FWS on the impacts of both the direct impacts (e.g., noise, oil spills) and indirect impacts (greenhouse gas emissions) of the lease sales and other management decisions regarding the NPR-A. Furthermore, any action to lease areas around Teshekpuk Lake is inconsistent with the agency’s obligation to avoid jeopardizing Steller’s and spectacled eiders.

i. Impacts on Threatened Polar Bears

The EIS must analyze the direct, indirect and cumulative impacts on ESA-listed polar bears. Polar bears are completely dependent on sea ice for hunting, migration, and other activities necessary for their survival. Due to global warming, the habitat of the polar bear is literally melting away (ACIA 2004, Derocher 2004). The United States Geological Survey concluded that reduced sea ice would result in loss of approximately two-thirds of the world’s polar bear population within 50 years, including all of Alaska’s polar bears (Amstrup et al. 2007). Oil and gas activities in the NPR-A and their resultant greenhouse gas emissions will contribute to polar bear extinction. BLM must analyze not only the direct impacts of oil and gas activities in the NPR-A on the polar bear, but also the greenhouse emissions of the oil and gas produced from these activities. Additional research and impact analysis must also be conducted in light of the recent observations of diseased polar bears, and the developing possibility of a unique mortality event for polar bears in the NPR-A.

ii. Impacts on Ice Seals

Ice seals, including ribbon seal, bearded seal, spotted seal, and ringed seal, are dependent on sea ice for survival, and threatened by many human activities including shipping, oil and gas development, and hunting. Climate change is the largest threat of all, and if greenhouse gas emissions continue at the current rate, scientist predict that sea ice in the seals’ ranges could decline 40 percent by mid-century, leading to widespread pup mortality (Holland et al. 2006, Wang and Overland 2009). Oil and gas activities in the NPR-A and their resultant greenhouse gas emissions will contribute to ice seal extinction. Ice seals also face severe and immediate threats from offshore oil and gas developments, which have the potential to destroy or modify large portions of the seals’ foraging and breeding habitat and exert lethal and sub-lethal impacts on population from oil and noise pollution and through direct disturbance and harassment (Fair and Becker 2000). Ocean acidification, which is predicted to increase rapidly in the Arctic

waters, may disrupt the marine food chain, resulting in widespread and deadly impacts to ice seals (Orr et al. 2005).

Offshore oil and gas development would be enabled by infrastructure in the NPR-A, and these impacts to ice seals must be analyzed in the FEIS. The FEIS must also analyze the total contributions of greenhouse gas emissions enabled by or directly resulting from oil and gas development within the NPR-A, broken down by each alternative. BLM must analyze not only the direct impacts of oil and gas activities in the NPR-A on polar bear, but also the greenhouse gas emission of the oil and gas produced by these activities and the activities that may occur in the Chukchi and Beaufort seas, that would be enabled by infrastructure on the NPR-A. Additional research, impact analysis, and mitigation measures, including permanently protected areas and caps on total greenhouse gas emissions resulting from the oil and gas development must also be conducted in light of the developing unique mortality event in ice seals, and the unknown but possibly spreading deadly disease process recently observed in these seals.

a. Ribbon Seal

In 2007, the Center filed a petition with NMFS to protect the ribbon seal under the ESA due to threats to its habitat from global warming. In December, 2008, NMFS denied the ribbon seal ESA protection, despite overwhelming scientific evidence showing the ribbon seal was in danger of extinction due to climate change. In September 2009, the Center and Greenpeace filed suit against the National Oceanic and Atmospheric Administration for denying protections to ribbon seal. Pursuant to a settlement agreement, NOAA will release a new 12-month finding on ESA listing of this species by December 10, 2012. The ribbon seal depends on sea ice for crucial activities, from resting to molting to raising young. The ribbon seals' winter sea-ice habitat in the Bering and Okhotsk Seas is predicted to decline by 40 percent by mid-century under a mid-level emissions scenario (Wang and Overland 2009). Impacts to ribbon seals from oil and gas development in the NRP-A are dismissed in the DEIS because ribbon seals occur far offshore. However, the DEIS did not consider impacts to the species resulting from oil and gas development greenhouse gas emissions and their contribution to climate change. The FEIS must analyze impacts to ribbon seals by alternative based on the greenhouse gas emissions that would be produced or enabled by each alternative. Cumulative impact analysis must reflect this.

b. Ringed, Spotted and Bearded Seals

The Center petitioned NMFS to grant ESA protection to bearded, ringed, and spotted seals in 2008. On October 21, 2010, the Obama administration finalized protection for the spotted seal in China and Russia, but denied protection for the spotted seal in the United States (75 FR 65239). On December 3, 2010, NMFS proposed ESA protection for bearded and ringed seals (75 FR 7746, 75 FR 77496). A final listing decision was due on June 10, 2012, and should come out at any time (76 FR 77476). Ringed, spotted and bearded seals are dependent on sea ice for biological life functions. The Bering, Okhotsk, and Barents Seas are projected to lose at least 40 percent of winter sea-ice area by 2050 (Wang and Overland 2009). Any remaining sea-ice habitat will likely be of low quality because the sea ice will be thinner and the ice will melt

sooner, leading to breakup of the sea ice during the reproductive and molting periods. The DEIS fails to analyze the impacts from oil and gas lease development caused greenhouse gas emissions on ringed, spotted and bearded seals. It also fails to acknowledge that greenhouse gas emissions resulting from development on or enabled by NPR-A leases could contribute to climate change. The DEIS states that the “effects of climate change on . . . ringed and bearded seals are uncertain.” This is despite a pending listing of threatened under the ESA for bearded and ringed seals, and a huge body of scientific evidence showing that ringed, spotted and bearded seals are under threat of extinction by mid-century due to climate change-induced sea ice loss and other factors, including increased oil and gas development in the area. The FEIS must analyze impacts to ringed, bearded and spotted seals by alternative based on the GHG emissions that would be produced or enabled by each alternative. Once a listing decision is issued for these species by NMFS, the FEIS must be amended based on these species’ listing status. Cumulative impact analysis must reflect this.

iii. Impacts on Pacific Walruses

The DEIS acknowledges that the main concern for the Pacific walrus population is climate change, which is causing a dramatic loss of its sea ice habitat and has a potential to change prey distribution and abundance. The DEIS also states that walruses are utilizing coastal areas differently due to the lack of late summer sea ice. The DEIS states that the K-6 Stipulation applies to alternatives B through D, but that a pipeline development corridor could be sited anywhere along the Chukchi coastline under alternative D. Although the DEIS goes on to acknowledge that the combined threats to walrus, including offshore oil and gas development and emerging diseases could become “significant in combination with future effects of climate change,” there is no analysis of how different alternatives may contribute to climate change and to other threats. This analysis must be included in the FEIS.

In February, 2008, The Center petitioned the FWS to protect the walrus under the ESA. On February 8, 2011, the FWS announced that listing the Pacific walrus was warranted but precluded and delayed protection for this species indefinitely by putting the walrus on the candidate list (76 FR 7634). Pursuant to a settlement agreement, FWS will make a listing decision by 2017. Thus, the FWS acknowledges that the Pacific walrus is deserving of protection. The FEIS should consider additional protections for Pacific walrus, including but not limited to, permanent wildlife refuge designation for critical walrus habitat along the length of the Chukchi coastline, especially Kassegaluk Lagoon, and a cap on greenhouse gas emissions enabled by, or tied to oil and gas leases. This is due to the documented negative impacts on walruses from climate change-caused lack of sea ice and other climate change issues (Cooper et al. 2006). These protections must be stronger than the suggestions for Special Areas in the DEIS, so that oil and gas lease sales will never be allowed to occur in these important walrus habitat areas.

2. Unusual Mortality Event

In the last 12 months, there have been several outbreaks of skin lesions resulting in unusual

mortality events in Alaska's marine mammals, particularly ice seals. On October 13, 2011, National Oceanic and Atmospheric Administration (NOAA) scientists observed a skin lesion disease outbreak in ringed seals. On December 20, 2011, NOAA and FWS declared an unusual mortality event involving multiple species including ice seals and walruses after scientists observed more than 60 dead ringed seals and more than 75 diseased seals in the Bering Sea and Arctic Alaska. Scientists also observed diseased and dead walruses at a mass haul-out near Point Lay.

This disease appears to be persisting in ice seal populations to present, resulting in illness and mortality. On March 7, 2012, a news release by NOAA reported that a ringed seal pup was captured in Yakutat, AK, with similar skin and fur loss symptoms to diseased seals in the Arctic (NOAA 2012). As the spring 2012 subsistence harvest of marine mammals continues, more diseased animals are likely to be observed. Winter conditions in 2011-2012 made for extremely unsuitable conditions for making observations in the Arctic and Bering Sea. Thus, the current status of the disease, and how it may have affected winter survival for marine mammals, is unknown (NOAA 2012). Once the summer field season research is completed, more information on the origins of the disease may be available, and must be included in the FEIS.

Polar bears may also be affected by a similar disease, manifested by hair loss and skin lesions that appear very similar to lesions found in diseased seals. As of April 6, 2012, field scientists had found hair loss on nine of the 33 bears they had captured. Unlike diseased seals and walruses, the bears with skin lesions appear to be healthy otherwise (Feidt 2012).

The cumulative impacts of the ongoing unusual mortality events for Arctic marine mammals must be considered in the EIS, as they may have significant adverse impacts on ice seal, polar bear and walrus populations. Even if the disease does not directly result in mortality of affected polar bears, impacts to ice seals, the bear's primary prey, could significantly impact polar bear survival, reproductive success, and overall population numbers. While the cause of the disease is unknown, thus far it has not been linked to any known viruses, bacteria or radiative causes (NOAA 2012). This disease may be linked to increased susceptibility of marine mammals to normally non-disease causing pathogens due to a variety of increased stressors from climate change, increased human activity (especially shipping and oil and gas operations), and higher levels of pollutants in the Arctic (Heimel 2012). Stress related to climate change and human disturbance can have a variety of effects on an organism, one of which is to reduce resistance to disease (Martin et al. 2010). The illness may simply be a manifestation of these stressors. Marine mammals that otherwise would be resistant to a common pathogen (possibly bacterial or fungal in origin) may become susceptible when stressed by the rapidly changing and developing conditions in the Arctic.

Thus, offshore drilling activities that would be enabled by infrastructure on the NPR-A, in addition to the stressors that will occur with climate change (as described above) could increase the incidence of mortality events for marine mammals in the Arctic. Stressors on marine mammals may also be directly related to development and exploration activities on the NPR-A land area, which increases a variety of stressors on wildlife, including sound, direct human-caused disturbance, degradation of habitat due to development and increased release of methane and other greenhouse gases. Because of the strong link between NPR-A oil and gas development

and offshore oil and gas development that would both act as a cumulative impact and be directly enabled by infrastructure on the NPR-A, the recent and ongoing unusual mortality events for Arctic marine mammals must be discussed both in the cumulative impacts section, and in direct environmental consequences of any alternative that increases oil and gas development in the Arctic, including the “no action” alternative.

Because the unusual mortality event is a developing issue, involving difficult-to-study and remote populations of marine mammals, the EIS must be updated after this winter’s (2011 to 2012) mortality and disease data is compiled and when and if a disease pathogen is identified by scientists. If the disease continues to progress and result in high levels of mortality for the already stressed ice seal, walrus and polar bear populations, new mitigation measures and protected habitat areas must be included in the FEIS. Lease sales of any part of the NPR-A based on the current DEIS impact and mitigation statements must not be completed until this unusual mortality event is included.

D. Alternatives and Mitigation

1. Range of Alternatives

BLM did not consider a reasonable range of alternatives and mitigation measures to reduce impacts on the environment. NEPA requires that the EIS “‘rigorously explore and objectively evaluate *all* reasonable alternatives’ to a proposed plan of action that has significant environmental effects. 40 C.F.R. § 1502.14(a) (2000). This is ‘the heart’ of an EIS.” *Natural Resources Defense Council v. U.S. Forest Service*, 421 F.3d 797, 813 (9th Cir. 2005). The purpose of NEPA’s alternatives requirement is to ensure agencies do not undertake projects “without intense consideration of other more ecologically sound courses of action, including shelving the entire project, or of accomplishing the same result by entirely different means.” *Env’t Defense Fund., Inc. v. U.S. Army Corps. of Eng’rs*, 492 F.2d 1123, 1135 (5th Cir. 1974); *see also, City of New York v. Dept. of Transp.*, 715 F.2d 732, 743 (2nd Cir. 1983) (NEPA’s requirement for consideration of a range of alternatives is intended to prevent the EIS from becoming “a foreordained formality.”); *Utahns for Better Transportation v. U.S. Dept. of Transp.*, 305 F.3d 1152 (10th Cir. 2002), *modified in part on other grounds*, 319 F.3d 1207 (2003). Whether an alternative is “reasonable” or not turns on whether it will accomplish the stated purpose for the project. *City of Carmel-By-The-Sea v. U. S. Dep’t of Transp.*, 123 F.3d 1142, 1155 (9th Cir. 1997).

Importantly, this evaluation extends to considering more environmentally protective alternatives and mitigation measures. *See, e.g., Kootenai Tribe of Idaho v. Veneman*, 313 F.3d 1094, 1122-1123 (9th Cir. 2002) (and cases cited therein). NEPA regulations require that alternatives “include appropriate mitigations measures.” 40 C.F.R. § 1502.14(f). Additionally, the regulations require that the analysis of environmental consequences discuss “means to mitigate adverse environmental impacts.” 40 C.F.R. § 1502.16(h).

An environmental review document must fully disclose and analyze impacts to any listed, candidate, or sensitive species, and discuss alternatives and enforceable mitigation measures to avoid, reduce, and mitigate impacts to the species.

Under this standard, BLM's range of alternatives is inadequate. For example, BLM should have considered alternatives that promote the reduction of greenhouse gas emissions, such as limiting lease sales. The DEIS completely failed to do this, even failing to include a viable no-action alternative that would simply not allow any lease sales in the NPR-A.

An alternative in which no further leasing in the NPR-A occurs, until and unless it is part of and consistent with a national plan to reduce greenhouse gas emissions by 80 percent by 2050, the levels top climate scientists such as Dr. Hanson indicate are necessary to avert the most disastrous impacts of global warming, is a completely reasonable alternative. In fact, it is an absolutely essential alternative if we as a nation are to successfully address the climate crisis. The failure to analyze such an alternative, or for that matter any alternatives that increase environmental protections in the NPR-A, itself is evidence of an inadequate NEPA process.

2. The No Action Alternative

The "no-action" alternative included in DEIS analysis does not fulfill BLM's obligation under NEPA, thus rendering subsequent analysis of the Environmental Consequences under each alternative inaccurate and incomplete. NEPA requires that alternative analysis in the EIS "include the alternative of no action." 40 C.F.R. § 1502.14(d). Under NEPA, "no action" means that the proposed activity would not take place. The purpose of the "no action" alternative is to provide a benchmark, enabling decisionmakers to compare the magnitude of the environmental effects of the action alternatives. Inclusion of such an analysis in the DEIS is necessary to inform Congress, the public, and the president as intended by NEPA. 40 C.F.R. § 1500.1(a). Because there is currently no commercial oil and gas development in the NPR-A, the current "no action" alternative is an "action" alternative, as defined by NEPA, rather than a baseline. A valid "no action" alternative would be an alternative that provides for no leasing and for no commercial oil and gas development to occur. This baseline would describe conditions currently and historically occurring at the NPR-A, where there are no commercial oil and gas developments.

In the DEIS, all alternatives, including the so-called "no action" alternative, allow for an "action" of oil and gas lease sales that would result in the construction of permanent infrastructure and would directly lead to degradation of wildlife habitat and ecological resources in vast swathes of the NPR-A, affecting from 50 percent to 100 percent of the land area depending on the alternative. As described in the DEIS, the very foreseeable activities associated with oil and gas development would have major impacts on ecological resources. Such impacts have not occurred at any time in the history of the NPR-A. Thus, labeling Alternative A, which would open up over 50 percent of the NPR-A to oil and gas leasing, a "no action" alternative does not meet BLM's NEPA obligations.

By framing the alternatives this way, BLM avoided its obligation under NEPA to evaluate the potential impacts of the proposed action. Alternative A as the "no action" alternative assumes

very similar levels of activity as Alternative B. This denies BLM and the public a baseline from which to analyze the impacts of the “action” alternatives. The establishment of the baseline biological condition of an affected area is a practical requirement of the NEPA process because “without establishing . . . baseline conditions . . . there is simply no way to determine what effect [an action] will have on the environment, and consequently, no way to comply with NEPA.” *Half Moon Bay Fisherman’s Mktg. Ass’n v. Carlucci*, 857 F. 2d 505, 510 (9th Cir. 1988). By using a false “no action” alternative that assumes a baseline of activity that has not yet occurred, BLM illegally avoids its obligation under NEPA to consider the impacts of its actions.

E. The Designation of Special Areas

The Special Areas recommended in Alternative B are simply suggestions, with no permanent protections for these areas. The weak protections provided by the Special Area designation could be readily changed by successive administrations. The BLM says as much, and states that “Special Area designation does not itself impede oil and gas development” (NPR-A DEIS 2.4.4) and that “Special Area designation itself does not impose specific protections” (NPR-A DEIS 2.1.2). Thus, according to the DEIS, it appears that designated Special Areas could be opened to oil and gas development without any changes to the Special Area designation. This highlights the complete lack of any real protection from oil and gas development provided by this designation. As written, these protections are profoundly weak, and do little, if anything, to prevent permanent oil and gas development anywhere in the Reserve, including Special Areas.

The Center and other groups have requested that the BLM provide permanent protections for special areas, by establishment of wildlife refuges, Wilderness designations, or legislatively protected BLM areas (i.e., Wild Lands designations). The DEIS dismisses these requests, stating that a Wilderness designation is “beyond the scope of this planning effort” (NPR-A DEIS 2.4.1), that the BLM no longer considers Wild Lands in its planning process (NPR-A DEIS 2.4.2), and that National Wildlife Refuge establishment is “beyond the scope of this planning effort” (NPR-A DEIS 2.4.6). These dismissals are put forth with no explanation or discussion, and therefore do not fulfill the need of a planning document as a true document of the planning process. Rather than the nonbinding measures currently put forth in the DEIS, the FEIS should include a definitive statement of administrative policy on this matter. Based on reasons discussed in great detail throughout this comment letter, we believe that the FEIS should include clear, meaningful, and permanent protections for all Special Areas proposed in Alternative B, along with permanent protections for additional ecologically important areas in the NPR-A.

F. Cumulative Effects

NEPA requires a thorough analysis of cumulative effects. The DEIS fails in this regard as well. The most significant cumulative effects to the resources of the NPR-A are those associated with global warming as discussed above. The DEIS’s treatment of such effects is superficial at best and often inaccurate. This alone renders the DEIS legally infirm under NEPA.

Additionally, the other significant source of cumulative effects on the resources of the NPR-A is further oil and gas leasing and development activity, both in the immediate vicinity of the NPR-A, and elsewhere in the range of the species dependant on the NPR-A. The majority of the North Slope has either already been leased or is subject to a pending proposal for leasing. The species of the NPR-A and adjacent waters, such as the polar bear, ice seals, walruses and yellow-billed loon face the very real risk of having much of their currently suitable habitat rendered unsuitable within the very near (and clearly foreseeable) future.

While disturbance and development of the terrestrial habitat of the North Slope is of the greatest concern for species dependant on the region, BLM must also examine the significant threat posed to the species by offshore oil and gas development. Shell is in the final stages of receiving permits for its planned 2012 oil and gas exploration programs in the Beaufort and Chukchi seas. These areas are all either foraging habitat or wintering habitat for the eiders and loons that nest in the NPR-A. Because yellow-billed loons and eiders forage offshore of their breeding areas, as well as in their wintering areas, they are highly vulnerable to direct impacts from offshore development. Additionally, construction and operation of offshore facilities will result in increased helicopter activity over onshore breeding areas along with other land-based disturbances related to servicing offshore operations. These offshore activities will affect not only waterbirds, but also polar bears, walruses, and other marine mammals.

As shown in Figure 2, the NPR-A and adjacent lands and waters are home to variety of species, and all wildlife using the Alaskan Arctic will be negatively impacted by oil and gas development and climate change. Impacts from offshore drilling that would be enabled by infrastructure on the NPR-A, as stated repeatedly but *not* analyzed in the DEIS, will have major adverse impacts on marine mammals and on the marine ecosystem. Offshore oil and gas development will at the very least result in incidental harassment of marine mammals due to increased ship traffic, seismic testing, and operation of drill rigs. However, the impacts from offshore oil and gas leasing have a high potential to be much greater, in the event of a major blowout, gas leak, or oil spill. As climate warming contributes to more severe and more frequent storm events, offshore drilling and shipping may be subject to extreme storm events, resulting in the possibility of large oil spills. Impacts on wildlife in the NPR-A from offshore drilling must be analyzed.

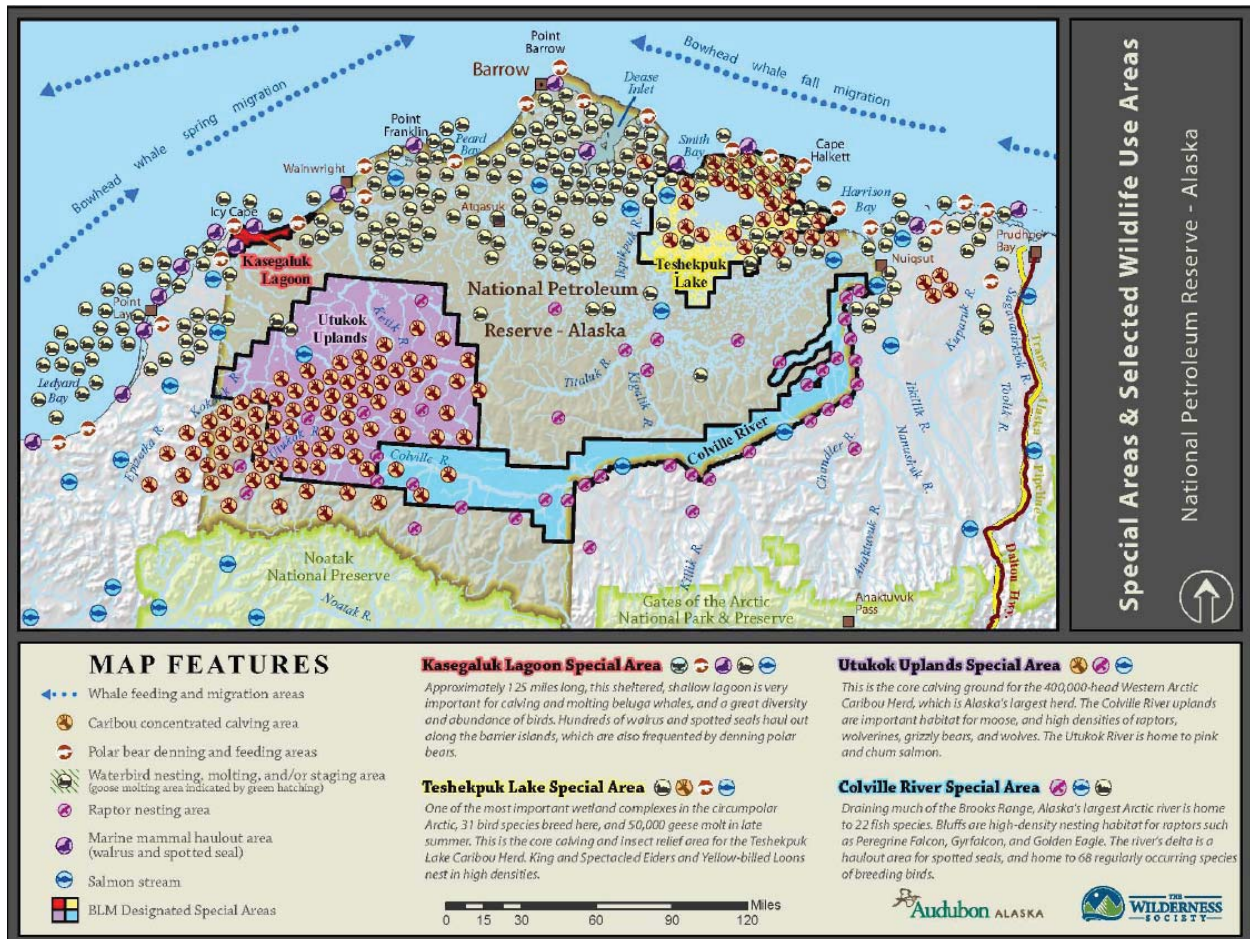


Figure 2. Wildlife species of the NPR-A area. Source: The Wilderness Society and Audubon, Alaska. Available at: <http://wilderness.org/content/obama-proposing-new-leasing-western-arctic-reserve>

Readily available information about the cumulative impacts of oil and gas activities both onshore and offshore in Alaska demonstrates significant cumulative effects on the resources of the NPR-A. However, these impacts are only superficially analyzed in the DEIS. This is not legally adequate. While less information is available about such activities and their impacts in Canada and Russia, what information that does exist indicates reason for concern and highly significant cumulative impacts.

In Canada, there are numerous proposals for oil and gas development in the Arctic as shown in Figure 3. The largest of these is the proposed Mackenzie Gas Project, which would likely result in wide-scale impacts to the Mackenzie River Delta and adjacent areas. Shell Canada Energy, Imperial Oil Resources and ExxonMobil Canada Properties received final approvals on March 2, 2012. This project will have major adverse impacts on wildlife and wildlife habitat, and also contribute a significant amount of GHGs. Yellow-billed loons are known to breed just to the east

of the Delta.⁴ The development of oil and gas resources in the Canadian Arctic would have comparable deleterious impacts on the yellow-billed loons and other sensitive waterbirds nesting in the region as similar development in the NPR-A and other areas of Alaska. Further detail on oil and gas projects in the Canadian Arctic is contained in the 2006 status review prepared by FWS for the polar bear (Schliebe et al 2006).

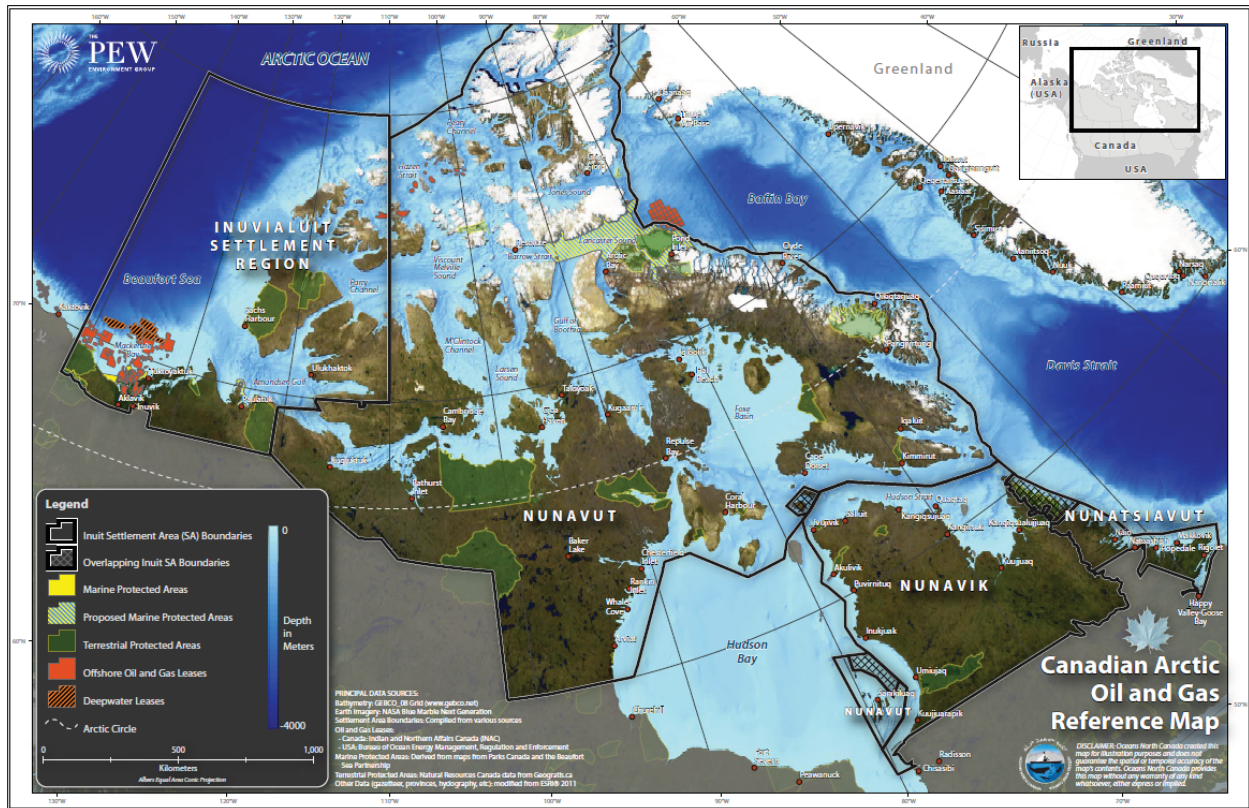


Figure 3. Oil and Gas Leases and proposed protected Areas in the Canadian Arctic. Source: Pew Environment Group. Available at: <http://oceansnorth.org/becoming-arctic-ready>

What information that is available regarding the impacts of oil and gas development in the Russian Arctic indicates likely disaster for the yellow-billed loon and other waterbirds. Both breeding areas for Russian nesting loons as well as marine wintering areas for Alaska nesting birds are subject to rapid industrial development in the Russian Arctic. Additional information on Russian Arctic oil development is contained in Schliebe et al (2006). The DEIS is devoid of discussion of such significant impacts.

An additional cumulative impact to the Arctic ecosystem of which the NPR-A is a part is the ongoing and projected increase in shipping in the Arctic. Such impacts are likely to be substantial, and information on them is readily available. *See, e.g.,* www.informaglobalevents.com/event/arcticshippingnorthamerica. Yet these foreseeable and substantial impacts are not discussed in the DEIS.

⁴ For the official Canadian government description of planned oil and gas activities in the Canadian Arctic see <http://www.aadnc-aandc.gc.ca/eng/1310583842498>. For an analysis of the cumulative impacts of these proposed activities, see <http://pubs.aina.ucalgary.ca/misc/74859.pdf>.

Another major cumulative impact not mentioned in the DEIS is the unusual mortality events for marine mammals, as discussed in detail in the marine mammal section.

Finally, many of the species dependant on the NPR-A, such as the yellow-billed loon, Pacific brant, and buff-breasted sandpiper, migrate from breeding or molting grounds in the NPR-A to wintering areas in North and South America and elsewhere. Many of these wintering grounds are undergoing rapid transformation, resulting in substantial cumulative effects on these species. There is little to no discussion of such impacts in the DEIS.

G. Conclusion

In sum, to further the goals of NEPA and provide full consideration and disclosure of the environmental consequences of the management of the NPR-A, BLM must take into account in its FEIS the direct, indirect and cumulative impacts of its proposal, including global warming impacts. BLM must analyze the greenhouse gas emission from the use of the fossil fuels produced from the lease sales that would be allowed under the various alternatives. Additionally, BLM must analyze the potential impacts on the wildlife and the environment in the lease sale area from further global warming. BLM should consider these impacts from its actions, all cumulative impacts affecting the species and communities in the Alaskan Arctic, and adjacent areas directly and indirectly affected by the lease sales. BLM must also take steps to avoid and mitigate all of these adverse affects of the lease sales. Unfortunately, this DEIS accomplishes none of these objectives. We believe that the only conclusion compatible with NEPA, the ESA, and common sense is to forgo the proposed lease sales entirely, withdraw the DEIS, and proceed with a new NEPA process that includes alternatives to increase protection of the NPR-A and the Arctic and reduce greenhouse gas emissions. Thank you for the opportunity to provide these comments.

Sincerely,



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THE POTENTIAL GREENHOUSE GAS EMISSIONS OF U.S. FEDERAL FOSSIL FUELS



The Potential Greenhouse Gas Emissions of U.S. Federal Fossil Fuels

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The Potential Greenhouse Gas Emissions of U.S. Federal Fossil Fuels

I. Executive Summary

This report was undertaken to facilitate a better understanding of the consequences of future federal fossil fuel leasing and extraction in the context of domestic and global efforts to avoid dangerous climate change. We estimate the potential greenhouse gas (GHG) emissions from developing the remaining fossil fuels in the United States (U.S.), including the emissions from developing publicly owned, unleased federal fossil fuels that constitute 450 billion tons of CO₂e.

We report the volume of these fossil fuels, including that of leased and unleased federal fossil fuels located beneath federal and non-federal lands and the outer continental shelf. These resource appraisals are used to estimate the life-cycle GHG emissions associated with developing crude oil, coal, natural gas, tar sands, and oil shale—including emissions from extraction, processing, transportation, and combustion or other end uses. We express potential emissions in gigatons (“Gt”) (one gigaton equals one billion tons) of carbon dioxide equivalent (CO₂e), and discuss them below in the context of global emissions limits and nation-specific emissions quotas.

Major findings are that:

- The potential GHG emissions of federal fossil fuels (leased and unleased) are 349 to 492 Gt CO₂e, representing 46% to 50% of potential emissions from all remaining U.S. fossil fuels. Federal fossil fuels that have not yet been leased for development contain up to 450 Gt CO₂e.
- Unleased federal fossil fuels comprise 91% of the potential GHG emissions of all federal fossil fuels. The potential GHG emissions of unleased federal fossil fuel resources range from 319-450 Gt CO₂e. Leased federal fossil fuels represent from 30-43 Gt CO₂e.
- The potential emissions from unleased federal fossil fuels are incompatible with any U.S. share of global carbon limits that would keep emissions below scientifically advised levels.

Potential GHG Emissions from U.S. Federal Fossil Fuels

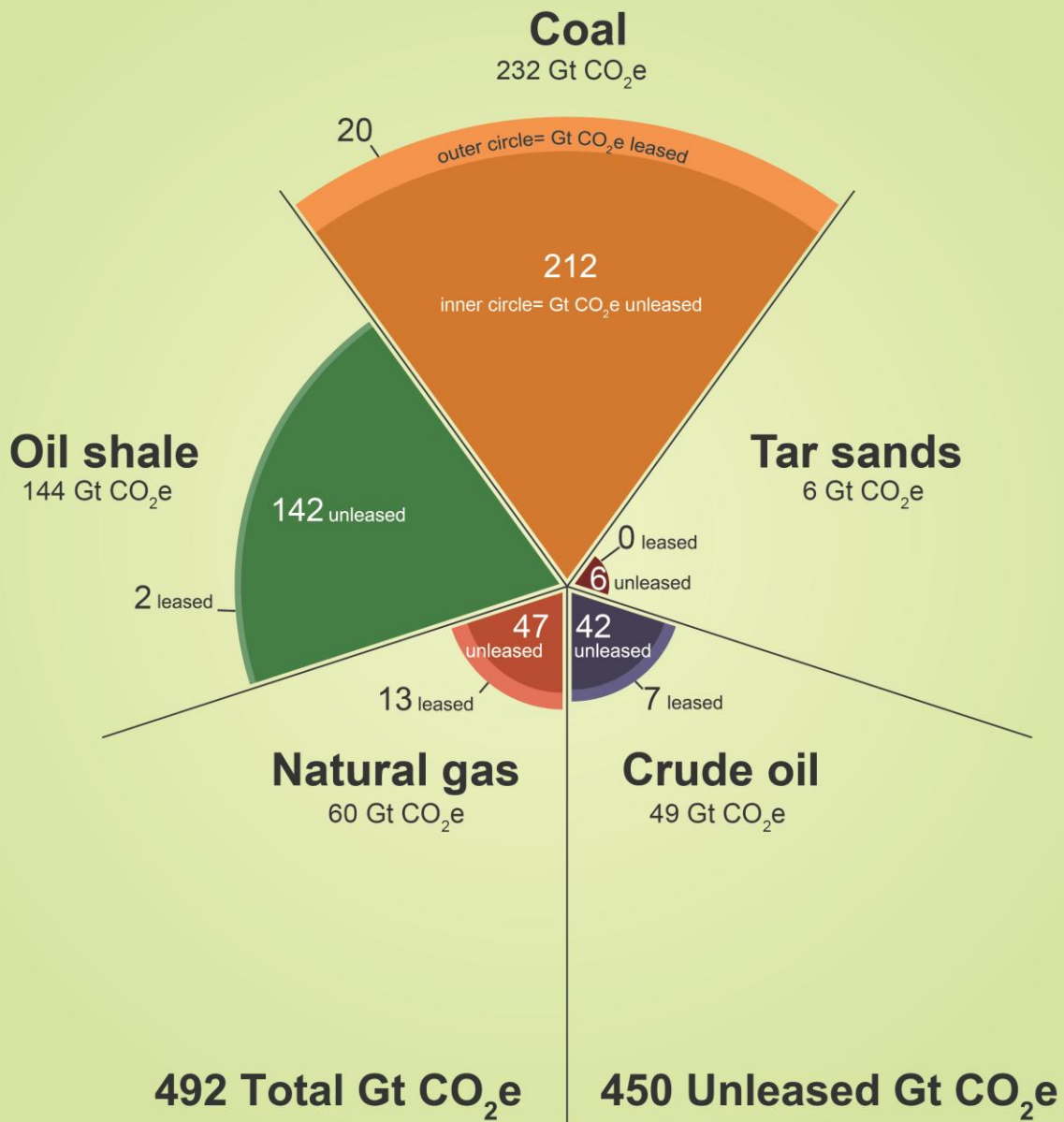


Figure 1. Potential emissions of leased and unleased federal fossil fuels.

Our results indicate that a cessation of new federal fossil fuel leasing could keep up to 450 Gt CO₂e from the global pool of potential future GHG emissions. (Figure 1.) This is equivalent to 13 times global carbon emissions in 2014 or annual emissions from

118,000 coal-fired power plants. This has a significant potential for GHG emissions savings that is best understood in the context of global limits and national emissions quotas.

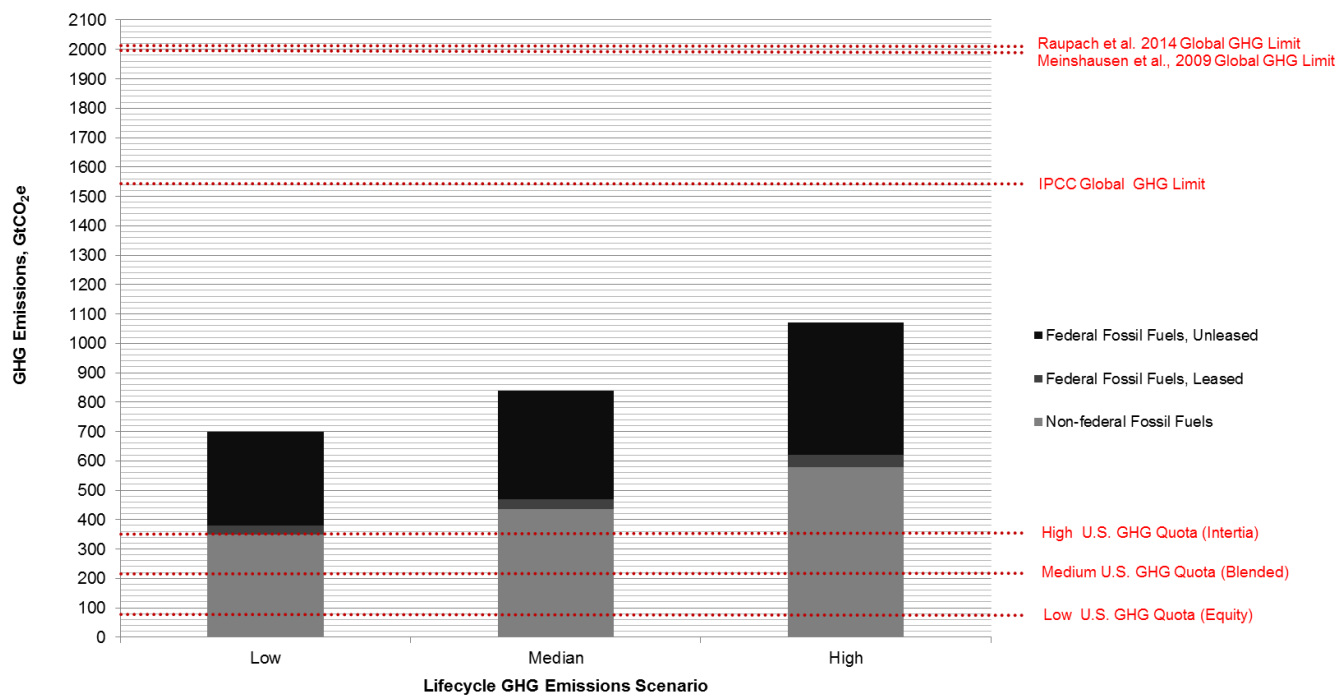
Carbon emission quotas are the maximum amount of greenhouse gases humanity can emit while still preserving a given chance of limiting average global temperature rise to a level that will not be catastrophic. The Intergovernmental Panel on Climate Change has recommended efforts to ensure that temperature increases remain below 2°C by century's end, a level at which dramatic adverse climate impacts are still expected to occur. Nation-specific emissions quotas are the amount of greenhouse gas emissions that an individual country can emitⁱ.

Studies that have apportioned global emissions quotas among the world's countries indicate that the U.S. share of the global emissions is limited, with varying estimates depending on the equity principles used. For example, Raupach et al. (2014) estimated three U.S. GHG emissions quota scenarios of 85Gt CO₂e, 220 Gt CO₂e, and 356 Gt CO₂e necessary to maintain only a 50 percent likelihood of avoiding 2°C (3.6°F) warming by century's end, depending on the equity assumptions used within a total global emissions limit. These represent a range of approximate equity assumptions for apportioning emissions quotas.ⁱⁱ Under any of those quotas, emissions from new federal fossil fuel leasing are precluded after factoring in the emissions of developing non-federal and already leased fossil fuels. (Figure 2.)

ⁱ In this report we use the terms "share of limit" and "quota" interchangeably and define them in the context of scientifically advised emission limitations exclusive of sequestration. In some cases, studies and reports also use the term "budget". Much of the literature, coverage, and usage of these issues utilize the terms in this way; however, in some cases carbon "budgets" are defined more broadly to encompass sources, fluxes and sinks; while "quotas" are defined more narrowly to encompass only limits on future emissions necessary to meet a certain average global temperature target. We feel this usage is appropriate here since "carbon budgets" generally refer to the total cumulative mass of carbon emissions allowable over time, while this report describes the total cumulative mass of carbon under federal and non-federal lands which may or may not be emitted into the atmosphere over time.

ⁱⁱ We use Raupach et al. (2014) U.S. emissions quotas for illustration purposes only; this report and its authors do not endorse equity assumptions made therein. We use the ratio of 1.39 CO₂e/CO₂ reported in Meinshausen et al. (2009) to convert the values reported in Raupach et al. (2014) from CO₂ to CO₂e. We also exclude Raupach et al.'s "future committed emissions" from their published -30, 67 and 165 GtCO₂ U.S. quotas to isolate the quotas from assumptions about "future committed emissions." Notably, under Raupach et al.'s "equity" scenario, "future committed emissions" already exceed the remaining U.S. quota; Raupach et al. thus report a remaining "equity" scenario quota of -30 Gt CO₂.

Potential Lifecycle GHG Emissions of Federal and Non-federal Fossil Fuels, and Global GHG Limits and U.S. GHG Quotas to Maintain 50% Likelihood of Keeping Warming Below 2°C (3.6°F) *



* GHG limits and quotas published in CO₂ are displayed in CO₂e using the ratio of 1.39 CO₂e/CO₂ reported in Meinshausen et al. (2009). U.S. GHG quotas from Raupach et al. 2014. Limits and quotas are lower for maintaining higher likelihood of limiting warming to below 2°C and/or keeping warming below a lower temperature, like 1.5°C.

Figure 2. Global carbon limits, U.S. emissions quotas and potential emissions from federal and non-federal fossil fuels.

II. Introduction

The Intergovernmental Panel on Climate Change (IPCC) recently warned that humanity must adhere to a strict “carbon limit” in order to preserve a likely chance of holding average global warming to less than 2°C (3.6°F) by the end of the century—a level of warming that still will cause extreme disruption to both human communities and natural ecosystems.¹ According to the IPCC, all future global emissions must be limited to about 1,000 gigatons (“Gt,” one gigaton equals one billion tons) of carbon dioxide (CO₂) to have a likely (>66%) chance of staying below 2°C.² The International Energy Agency has projected that the entire remaining 1,000 Gt CO₂ (1,390 Gt CO₂eⁱⁱⁱ) carbon budget will be consumed by 2040 on the current emissions course.³

Carbon quotas are the maximum amount of greenhouse gases humanity can emit while still preserving a given chance of limiting average global temperature rise to a level that will not be catastrophic. The Intergovernmental Panel on Climate Change has used a carbon limit to keep temperature increases below 2°C by century’s end, a level at which dramatic adverse climate impacts are still expected to occur. Nation-specific emissions

quotas are the amount of greenhouse gas emissions that an individual country can emit.^{iv}

Studies that have apportioned global emissions quotas among the world's countries indicate that the U.S. share of the global emissions is limited, with varying estimates depending on the equity principles used. For example, Raupach et al. (2014) estimated three U.S. GHG emissions quota scenarios of 85 Gt CO₂e, 220 Gt CO₂e, and 356 Gt CO₂e necessary to maintain only a 50 percent likelihood of avoiding 2°C (3.6°F) warming by century's end, depending on the equity assumptions used within a total global emissions limit. These represent a range of approximate equity assumptions for apportioning emissions quotas.^v Under any of those quotas, emissions from new federal fossil fuel leasing are precluded given the potential emissions from already-leased federal fossil fuels and those of non-federal fossil fuels.

Raupach et al.'s three scenarios are based on:

- High (inertia): Favors “grandfathering” of emissions, favoring a distribution of quota emissions to nations or regions with higher historical emissions.
- Medium (blended): Blends “inertia” and “equity” emissions.
- Low (equity): Favors a distribution of quota emissions based on population distribution, or emissions per capita, in regions or nations.

In 2013, the U.S. emitted 6.67 Gt CO₂e,⁴ the majority (85%) coming from the burning of fossil fuels,⁵ and accounting for 15% of global emissions.⁶ A 2015 analysis by an international team of climate experts⁷ suggests that for a likely probability of limiting warming to 2°C, the U.S. must reduce its GHG emissions in 2025 by 68 to 106% below 1990 levels, with the range of reductions depending on the sharing principles used.⁸ Accordingly, U.S. GHG annual emissions in 2025 would have to range between 2 Gt CO₂e (i.e., 68% below 1990) and negative emissions of -0.4 Gt CO₂e (i.e., 106% below 1990), significantly below current emissions of ~6.7 Gt CO₂e. Where negative emissions are required, the remaining carbon budget has been exhausted.

Under the current U.S. “all of the above” energy policy, federal agencies lease lands to private companies to extract and sell federal fossil fuel resources, including submerged offshore lands of the outer continental shelf. Leases initially last ten years, or twenty

^{iv} Emissions quotas are one among many mechanisms for determining equity and fairness in international climate negotiations. Equity principles generally include assumptions about different countries' historical responsibility for climate emissions, their ability to mitigate emissions, as well as measures of developed country support for emissions mitigation and adaptation in developing countries. While we are only using emissions quotas to illustrate the size of U.S. fossil fuel resources, we recognize that emissions quotas cannot be discussed independently from climate finance commitments.

^v We use Raupach et al. (2014) U.S. emissions quotas for illustration purposes only; this report and its authors do not endorse equity assumptions made therein. We use the ratio of 1.39 CO₂e/CO₂ reported in Meinshausen et al. (2009) to convert the values reported in Raupach et al. (2014) from CO₂ to CO₂e. We also exclude Raupach et al.'s “future committed emissions” from their published -30, 67 and 165 GtCO₂ U.S. quotas to isolate the quotas from assumptions about “future committed emissions.” Notably, under Raupach et al.'s “equity” scenario, “future committed emissions” already exceed the remaining U.S. quota; Raupach et al. thus report a remaining “equity” scenario quota of -30 Gt CO₂.

years in the case of coal, and may continue indefinitely once successful mineral extraction begins. Though these leases collectively span many tens of millions of acres, federal agencies do not currently track or report the nation-wide cumulative GHG emissions that result from federal leasing of fossil fuel reserves. There have been studies that account for past emissions from federal fossil fuel leasing. For example, a 2014 Stratus Consulting report completed for The Wilderness Society, titled *Greenhouse Gas Emissions from Fossil Energy Extracted from Federal Lands and Waters: An Update*, estimated that, in calendar year 2012, emissions from federal fossil fuel production were 1.344 Gt CO₂e, or 21% of all U.S. GHG emissions that year.⁹ A 2015 analysis completed by the Climate Accountability Institute for the Center for Biological Diversity and Friends of the Earth estimated that federal fossil fuel production accounted for 1.278 Gt CO₂e of emissions in 2012, and during the past decade contributed approximately 25% of all U.S. GHG emissions associated with fossil fuel consumption, which represents around 3-4% of global fossil fuel emissions during that time.¹⁰ Yet, there has been no assessment of the potential GHG savings from sequestering remaining unleased federal fossil fuels.

This report models the total amounts and potential GHG emissions associated with the remaining federal and non-federal fossil fuels in the U.S. We compiled federal and industry inventories of total fossil fuel resources and, using standard life-cycle assessment guidelines, we calculated life-cycle GHG emissions associated with all phases of developing federal and non-federal coal, crude oil, natural gas, tar sands, and oil shale resources. We evaluated low, median, and high emission scenarios for each of the fossil fuels studied to account for some of the uncertainties associated with producing some fossil fuels.

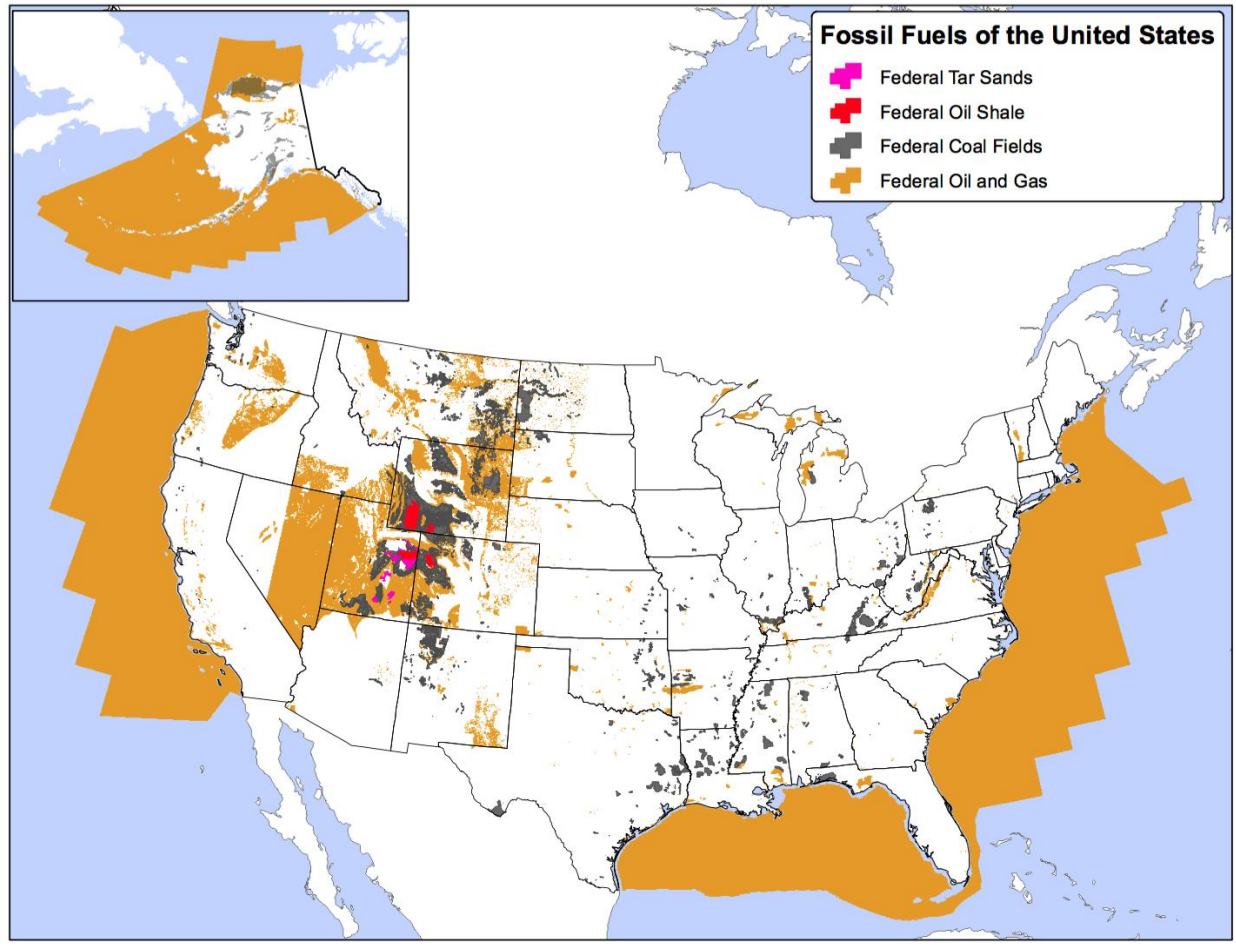


Figure 3. Map of U.S. Federal Fossil Fuels.

Our analysis focuses on the potential GHG emissions from the remaining unleased federal fossil fuel resources in the U.S. Keeping these fossil fuels in the ground would contribute significantly to global efforts to prevent combustion emissions from remaining fossil fuel resources. For the purposes of this report, unleased federal fossil fuels are those federal fossil fuel resources that are not currently leased to private companies. They include unleased recoverable federal coal reserves, federal oil shale, federal crude oil, federal natural gas, and federal tar sands. Unleased federal fossil fuels include resources that are available for leasing under current federal policy and that could become available for leasing under future federal policy.¹¹

Key terms

All U.S. fossil fuels include all federal and non-federal recoverable coal reserves, oil shale, crude oil, natural gas and tar sands (onshore and offshore).

Federal fossil fuels are federally controlled, publicly owned fossil fuel resources. Federal fossil fuels are located beneath lands under federal and other ownerships, where the federal government owns subsurface mineral rights. They are also located “offshore,” beneath submerged public lands of the outer continental shelf. Federal fossil fuels include recoverable federal coal reserves, federal oil shale, federal crude oil, federal natural gas and unleased federal tar sands.

Leased federal fossil fuels are federal fossil fuel resources, including proved reserves and resources under non-producing leased land, as classified by the Bureau of Ocean Energy Management (BOEM) and Bureau of Land Management (BLM), which are currently leased to private companies. These include leased federal recoverable coal reserves, leased federal oil shale, leased federal crude oil, leased federal natural gas and leased federal tar sands.

Non-federal fossil fuels are fossil fuel resources calculated by subtracting federal fossil fuel amounts from total technically recoverable oil resources, total technically recoverable natural gas resources, and total recoverable coal reserves in the United States as provided by EIA 2012a.

Unleased federal fossil fuels are federal fossil fuel resources that are not leased to private companies. These include unleased recoverable federal coal reserves, unleased federal oil shale, unleased federal crude oil, unleased federal natural gas, and unleased federal tar sands.

Recoverable coal reserves are the portion of the Demonstrated Reserve Base that the Energy Information Agency estimates may be available or accessible for mining.

Federal recoverable coal reserves are the federally controlled portion of recoverable coal reserves.

Crude oil is onshore and offshore technically recoverable federal and non-federal crude oil resources. **Federal crude oil** is federally controlled crude oil.

Natural gas is onshore and offshore technically recoverable federal and non-federal natural gas resources. **Federal natural gas** is federally controlled natural gas.

Federal oil shale is federally controlled oil shale that is geologically prospective according to deposit grade and thickness criteria in the Bureau of Land Management’s 2012 Final Oil Shale and Tar Sands Programmatic Environmental Impact Statement (PEIS) and Record of Decision (ROD). Geologically prospective oil shale resources in

Colorado and Utah are deposits that yield 25 gallons of oil per ton of rock (gal/ton) or more and are 25 feet thick or greater. In Wyoming geologically prospective resources are deposits that yield 15 gal/ton or more and are 15 feet thick or greater.

Tar sands are estimated in-place tar sands resources. **Federal tar sands** are federally controlled tar sands.

Proved or proven reserves are estimated volumes of hydrocarbon resources that analysis of geologic and engineering data demonstrates with reasonable certainty are recoverable under existing economic and operating conditions. Reserve estimates change from year to year as new discoveries are made, existing fields are more thoroughly appraised, existing reserves are produced, and prices and technologies change. Because establishing proved reserves requires drilling, which first requires leasing, proved federal fossil fuel reserves are necessarily leased, and unleased federal fossil fuels necessarily are not proved.

Technically recoverable refers to oil and gas resources that are unleased but producible using current technology without reference to their economic viability.

In-place resource is the entire fossil fuel resource in a geologic formation regardless of its recoverability or economic viability.

II. Research Methodology

Greenhouse gas (GHG) emissions associated with developing fossil fuel resources were estimated by (a) quantifying the volume and energy value of federal and non-federal fossil fuels, (b) determining the end uses and proportions of different end-use products made from fossil fuels, and (c) estimating the total GHG emissions from developing these resources and processing them into end-use products, by multiplying the total volume energy value of fossil fuel products by their life-cycle emissions factors.

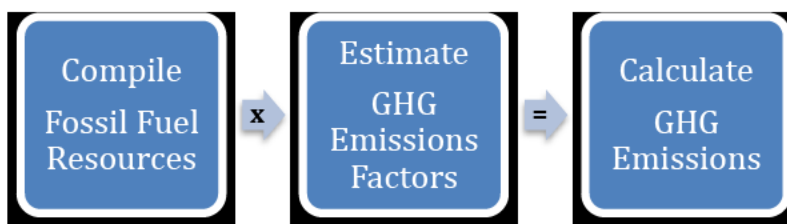


Figure 4. Research methodology

A) Quantifying Fossil Fuel Resources Volumes and Energy Values

Federal and non-federal fossil fuel quantities were obtained from federal estimates by the Bureau of Land Management (BLM), Energy Information Agency (EIA), U.S. Geological Survey (USGS), Office of Natural Resource Revenue (ONRR), the Department of Interior (DOI), and Congressional Research Service (CRS). Federal agencies similarly report the technically recoverable resources for crude oil and natural gas based on a consistent definition. For coal, agencies estimate recoverable coal by assessing the accessibility and recovery rates for the demonstrated coal base. For oil shale and tar sands the quantity is based on the resource available and in-place resources, which do not attempt to characterize the resource based on the likelihood of development. Unleased volumes of federal fossil fuels were calculated by subtracting leased volumes from the sum of technically recoverable quantities.

Quantities of federal and non-federal crude oil, natural gas, coal, oil shale and tar sands were summed and converted into values that represent each fossil fuel's energy content, called its primary energy value. This was done by multiplying the fossil fuel volumes by a heating value factor that represents the resource's energy content. Lower Heating Values were used for all fuels except coal, where the Higher Heating Value was taken as per convention for solid fuels in the U.S. Heating values for each resource were taken from Oak Ridge National Laboratory (ORNL), and can be found in the *Fossil Fuel Volumes to Primary Energy Conversions* section in Appendix I.

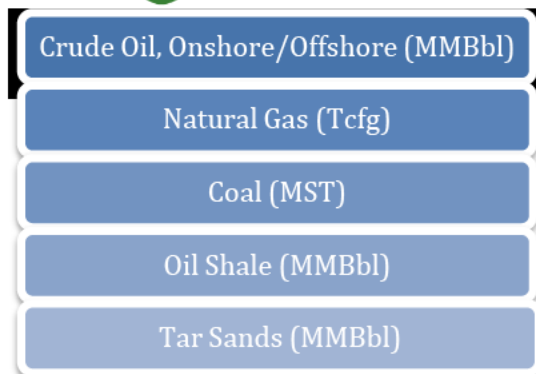


Figure 5. Fossil fuels analyzed

Figure 3 above shows the five fossil fuel types analyzed as they are broadly defined by federal agencies: Oil (onshore and offshore), gas (onshore and offshore) coal, oil shale and tar sands. The hydrocarbons included within federal oil and gas definitions are reported in Table 1 below.

Fossil fuel type	Crude oil	Condensate	Natural gas liquids	Dry natural gas	Gas, wet after lease separation	Non-associated gas, wet after separation	Natural gas associated-dissolved, wet after lease separation	Coalbed methane
Onshore oil	x	X	x					
Offshore oil	x	X	x					
Onshore gas				x	x	x	x	x
Offshore gas				x	x	x	x	x

Table 1. Hydrocarbons in the categories of crude oil and natural gas

B) Determining the End-Use Products Made from Fossil Fuels

Each fossil fuel resource was converted to a value that represents its energy content and divided into amounts used as inputs for different end-use products. We allocated the proportions of each resource into end-use products as follows:

- The energy in crude oil resources was proportionally divided into: finished motor gasoline, distillate fuel oil, kerosene, liquefied petroleum gases (LPG), petroleum coke, still gas and residual fuel oil.
- The energy in natural gas resources was split into residential, commercial, industrial, electric power and transportation end-use sectors.
- The energy in coal reserves was divided to electric power, coke and other industrial uses.
- Energy in tar sands and oil shale was assumed to be processed into end-use products analogous to crude oil.

These proportions make it possible to apply end-use product specific life-cycle emissions factors. For each product we determined the amount that could be yielded from the initial energy after processing, using a “primary energy factor” derived from

figures and conversion factors from sources in the literature, such as those developed at the National Renewable Energy Laboratory (NREL).



Figure 6. Steps to determine fossil fuel amounts and apply specific energy and emissions factors

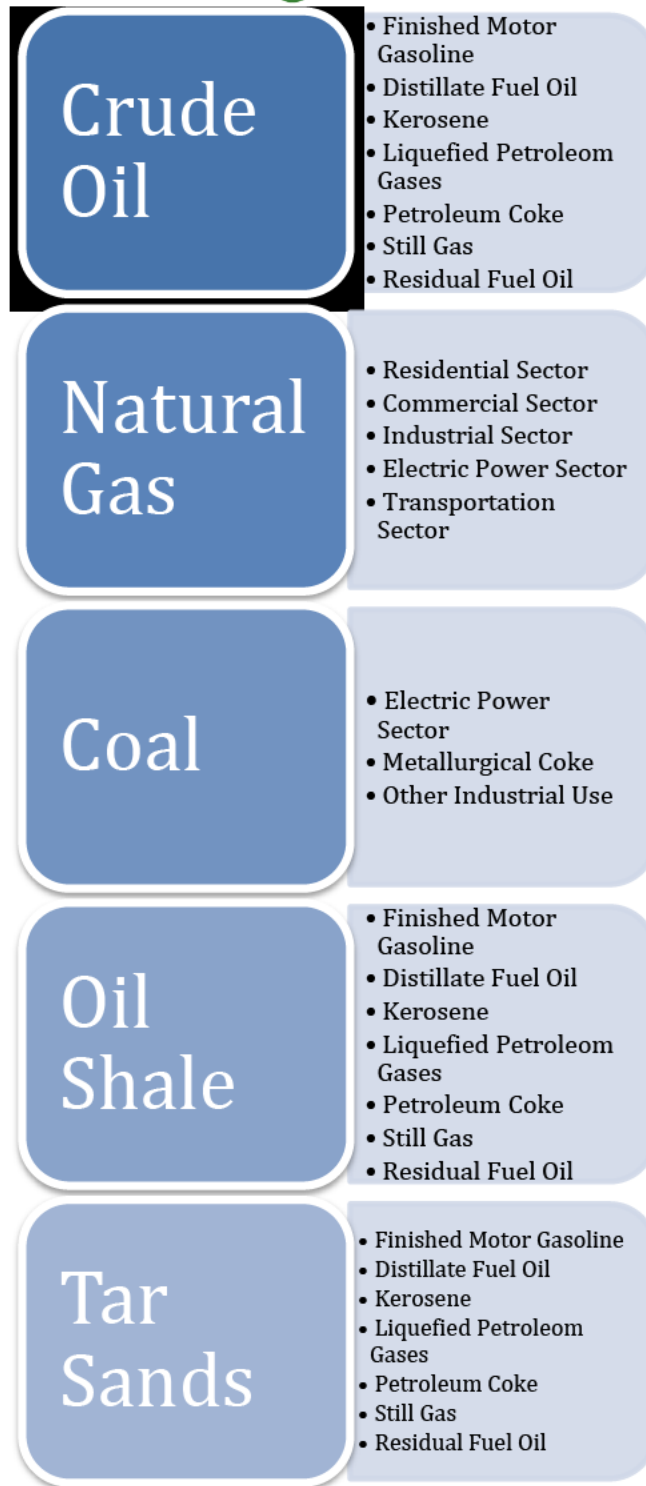


Figure 7. Fossil fuel resources and end-use products and sectors

C) Multiplying the Quantity of Fossil Fuel Energy by GHG Emissions Factors

The total energy value of each fossil fuel product end use was multiplied by product-specific life-cycle emissions factors to estimate the total GHG emissions. Life-cycle GHG emissions factors represent the amount of GHGs released when burning one unit 15

of energy. In peer-reviewed life-cycle assessments of fossil fuels, there are uncertainties associated with the GHG emissions of some fuels. For example, the life-cycle emissions associated with land use change resulting from coal extraction can be a source of uncertainty given differing amounts of methane leakage. To account for these uncertainties, the analysis used three scenarios for each fossil fuel corresponding to high, median, low GHG emissions factors reported in the scientific literature. The low GHG emissions factor scenario was chosen as the base case, and the high emissions factor scenario is the worst case scenario (most inefficient use of fossil fuels).

Each scenario represents different magnitudes (high, median and low) of global warming pollution associated with different fossil fuels. The high emissions scenario represents the worst-case greenhouse gas pollution scenario. Where available we used emissions factors from research by the U.S. national energy laboratories including Argonne National Laboratories' GREET tool and several meta-analyses from NREL that produced harmonized emissions-factors based on extensive prior research. Although emissions factors can vary following changes in any of the parameters in the underlying study, Table 2 in Appendix II highlights key parameters that significantly affect the magnitude of the emission factor and consequently influence whether it is characterized as low, median or high.

Where necessary, the following end-use product specific adjustments were made to improve the accuracy of life-cycle emissions factors:

- A carbon storage factor was determined for the following end-use products: metallurgical coke from coal, distillate fuel, liquefied petroleum gases (LPGs), petroleum coke from crude oil, and still gas.¹² This is to account for a proportion of carbon in the fossil fuel resource that is stored in the end product and not combusted or otherwise emitted. For example, some of the carbon in petroleum coke remains in products such as urea and silicon carbide, and the carbon storage factor reflects this.
- A shale-play weighting factor was applied to calculate emissions from natural gas to account for some studies that suggest that there may be higher amounts of methane released with natural gas extracted from shale versus conventional resources.¹³
- These calculations were summed to present results in 100-year Global Warming Potentials, represented as gigatons CO₂ equivalent (Gt CO₂e).

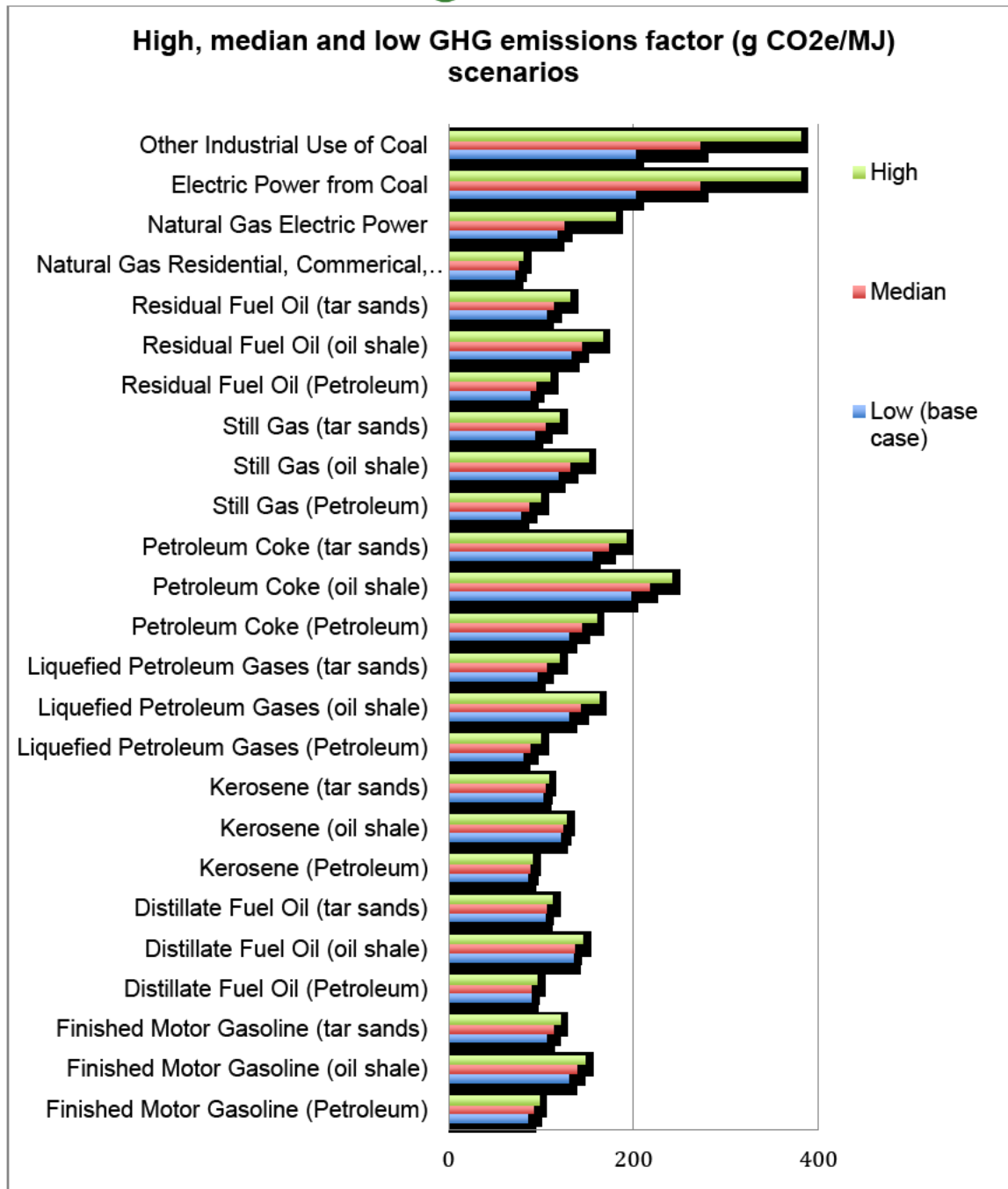


Figure 8. High, median and low (base case) GHG emissions factor scenarios.

Appendix I provides detailed methodologies for estimating fossil fuel volumes, converting fossil fuel volumes to primary energy, and calculating resource and end-use product-specific life-cycle emission factors. The full list of sources used to estimate fossil fuel amounts, primary energy factors, proportions of end-use products and sectors, carbon storage factors, and product specific life-cycle emissions factors are available in Appendix II.

III. Results

Our results indicate that:

1. The potential GHG emissions federal fossil fuels, leased and unleased, are 348.96 to 492.22 Gt CO₂e, representing 46% to 50% of potential emissions from all remaining U.S. fossil fuels; The potential GHG emissions of federal and non-federal fossil fuels are 697-1,070 Gt CO₂e. Unleased federal fossil fuels comprise 91% of the potential GHG emissions of all federal fossil fuels. The potential GHG emissions of unleased federal fossil fuel resources range from 319.00 to 449.53 Gt CO₂e. Leased federal fossil fuels represent from 29.96 to 42.69 Gt CO₂e;
2. Unleased federal recoverable coal accounts for 36% to 43% of the potential GHG emissions of all remaining federal fossil fuels, from 115.32 to 212.26 Gt CO₂e. Leased federal recoverable coal represents from 10.68 to 19.66 Gt CO₂e of potential emissions.
3. Unleased federal oil shale accounts for 29% to 35% of potential GHG emissions of all remaining federal fossil fuels, ranging from 123.17 to 142.07 Gt CO₂e. Leased federal oil shale accounts for 0.3% to 0.6% of potential GHG emissions of all remaining federal fossil fuels, representing 2 Gt CO₂e;
4. Unleased federal natural gas accounts for 10% to 11% of potential GHG emissions of all remaining federal fossil fuels, ranging from 37.86 to 47.26 Gt CO₂e, of which 36% are onshore and 64% are offshore. Leased federal gas represents 10.39 to 12.88 Gt CO₂e, 47% of which are onshore and 53% are offshore.
5. Unleased federal crude oil accounts for 9% to 12% of potential GHG emissions of all remaining federal fossil fuels, ranging from 37.03 to 42.19 Gt CO₂e, of which 28% are onshore and 72% are offshore. Potential emissions from leased federal crude oil represents from 6.95 to 7.92 Gt CO₂e, of which 33% are onshore and 67% are offshore.
6. Unleased federal tar sands accounts for 1% to 2% of potential GHG emissions of all remaining federal fossil fuels, ranging from 5.62 to 5.75 Gt CO₂e.

Federal versus non-federal fossil fuels

The potential GHG emissions from federal and non-federal fossil fuels were compared to contextualize the proportion that is federally owned. The results indicate that 34% of all remaining fossil fuels, based on the energy content of those fuels, are federally owned; these represent 348.96 to 492.22 Gt CO₂e of potential GHG emissions.

Table 2. GHG emissions, in GtCO₂e, from federal and non-federal fossil fuels

	Low	Median	High
Federal Leased	29.96	34.65	42.69
Federal Unleased	319.00	369.98	449.53
Non-federal	348.49	435.14	577.78
Total	697.45	839.77	1,070.00

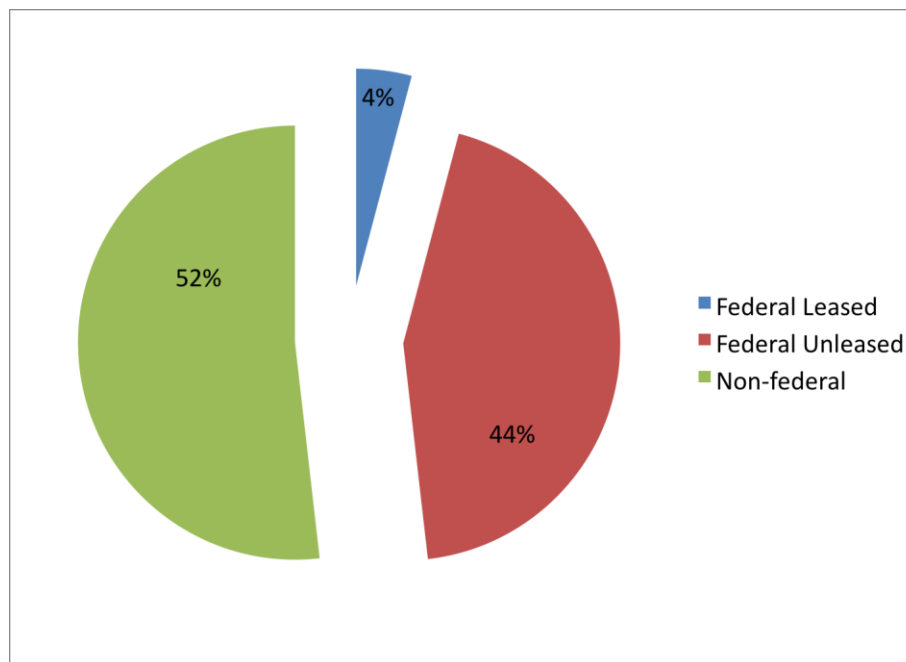


Figure 9. Relative potential emissions of federal and non-federal fossil fuels

Leased and unleased federal fossil fuels

Unleased and leased federal fossil fuels were examined to measure the GHG pollution from past leasing and to estimate the potential GHG emissions of unleased federal fossil fuels. Leased emissions are calculated using volumes of proved offshore and onshore oil and gas, volumes of offshore and onshore oil and gas underlying non-producing leased land, amounts of leased coal, and volumes of leased oil shale. The potential GHG emissions from unleased fossil fuel resources are approximately ten times greater than the emissions from currently leased federal fossil fuels.

Table 3. GHG Emissions (Gt CO₂e) from leased and unleased federal fossil fuels

	Low	Median	High
Federal Leased (Total)	29.96	34.65	42.69
<i>Crude Oil</i>	6.95	7.38	7.92
<i>Natural Gas</i>	10.39	11.01	12.88
<i>Coal</i>	10.68	14.19	19.66
<i>Oil Shale</i>	1.94	2.07	2.23
Federal Unleased (Total)	319.00	369.98	449.53
<i>Crude Oil</i>	37.03	39.32	42.19
<i>Natural Gas</i>	37.86	40.13	47.26

<i>Coal</i>	115.32	153.19	212.26
<i>Oil Shale</i>	123.17	131.67	142.07
<i>Tar Sands</i>	5.62	5.67	5.75

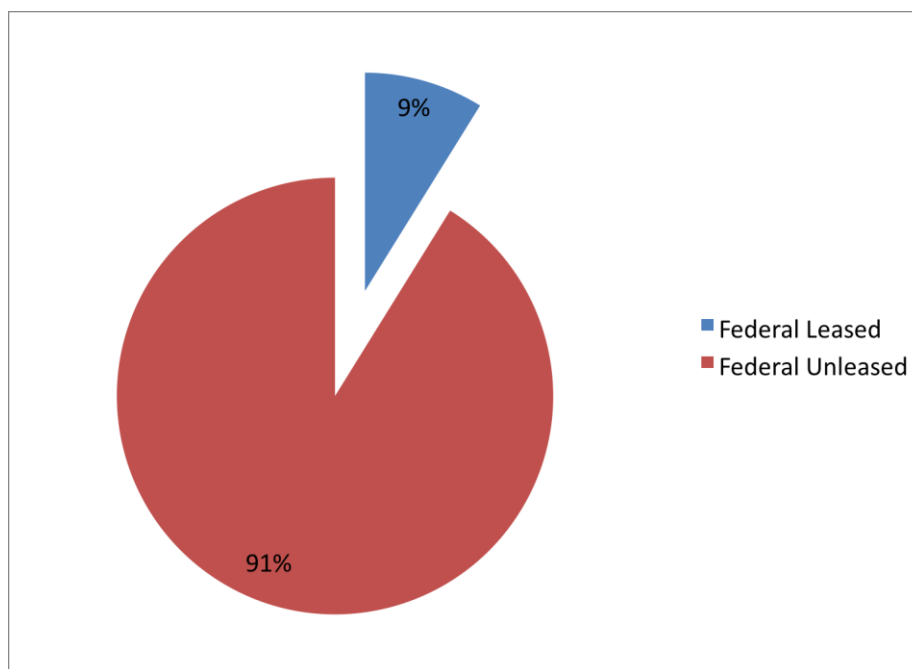


Figure 10. Low GHG emission factor scenario for leased and unleased federal fossil fuels

Unleased federal fossil fuels by resource type

The GHG emissions from unleased federal fossil fuels were evaluated by resource type. In a low emissions factor scenario, coal and oil shale are the biggest contributors of greenhouse gases. Under a high emissions factor scenario, coal is the biggest contributor of GHG pollution.

Table 4. GHG emissions (GtCO₂e) from unleased federal fossil fuels by resource type

	Low	Median	High
Federal Unleased			
<i>Crude Oil</i>	37.03	39.32	42.19
<i>Natural Gas</i>	37.86	40.13	47.26
<i>Coal</i>	115.32	153.19	212.26
<i>Oil Shale</i>	123.17	131.67	142.07
<i>Tar Sands</i>	5.62	5.67	5.75

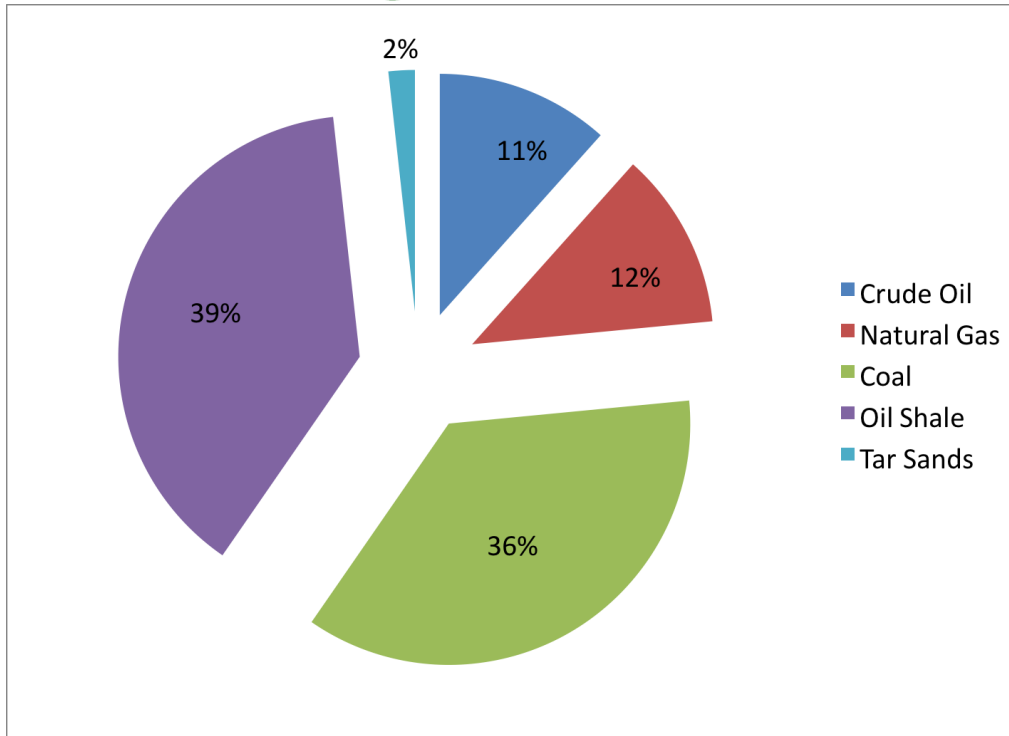


Figure 11. GHG emissions from unleased federal fossil fuels by resource type (low emissions scenario)

Coal

The potential greenhouse gas emissions from unleased recoverable coal reserves and leased recoverable coal reserves range from 115 to 212 Gt. This analysis used “recoverable coal reserves” when estimating the GHG emissions from coal, which is a common and conservative estimate of the portion of coal that could be extracted.

Table 5. GHG emissions (GtCO₂e) from federal coal

	Mass (MMST)	Low	Median	High
Federal Recoverable Coal Reserves				
<i>Unleased</i>	86,204	115.32	153.19	212.26
<i>Leased</i>	7,376	10.68	14.19	19.66

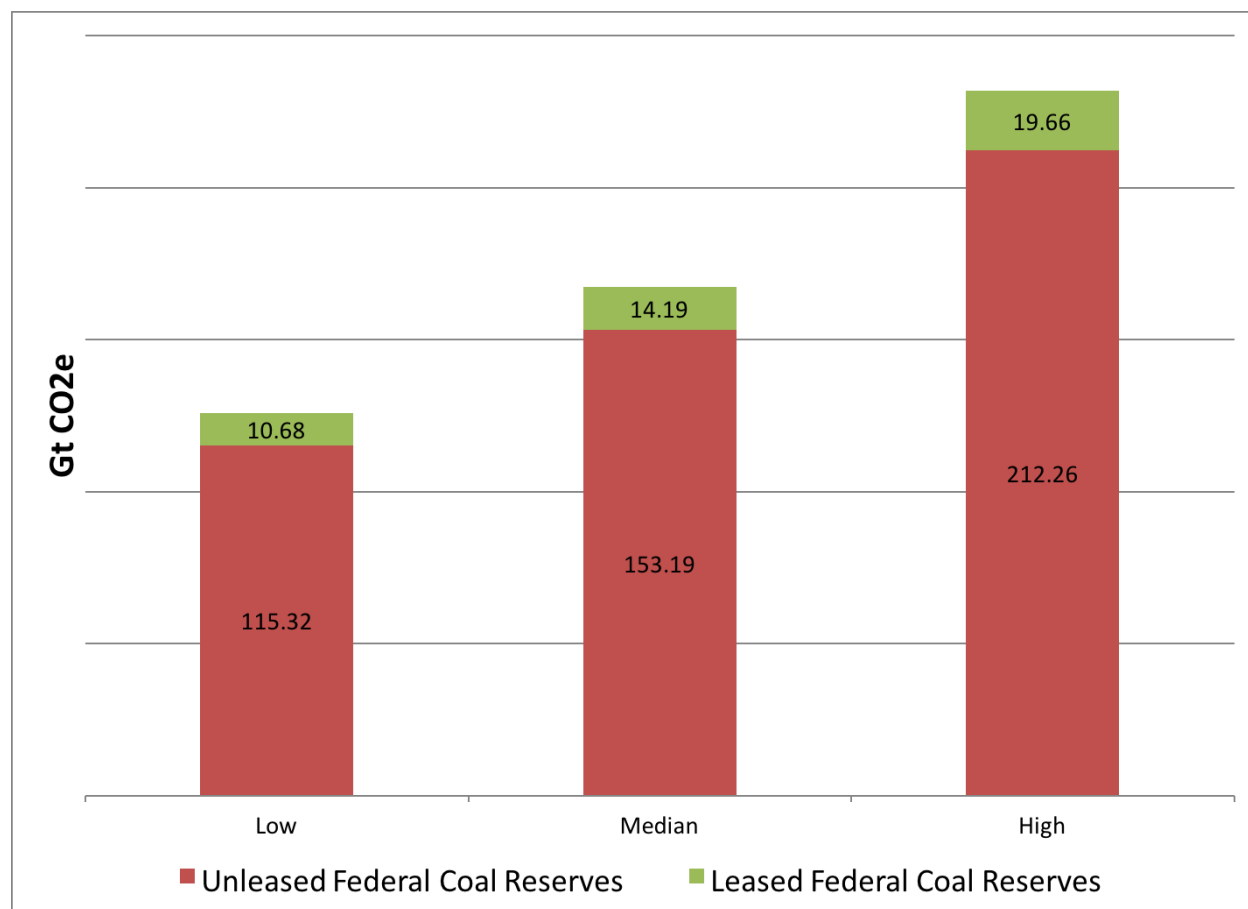


Figure 12. GHG emissions from federal coal under low, median and high emissions scenarios

Oil Shale

We analyzed the potential GHG emissions of federal oil shale and the portion of federal oil shale that is available for leasing under current federal policies. Since the life cycle GHG emissions of oil shale extraction and production are more than 50% greater than conventional crude oil per unit energy, oil shale resource results in the most potential GHG emissions per unit of energy delivered for all fossil fuels except coal. Federal oil shale includes only the resource that is geologically prospective according to deposit grade and thickness criteria in the Bureau of Land Management’s (BLM) 2012 Final Oil Shale and Tar Sands Programmatic EIS and Record of Decision. Geologically prospective oil shale resources in Colorado and Utah are deposits that yield 25 gallons of shale oil per ton of rock (gal/ton) or more and are 25 feet thick or greater. In Wyoming geologically prospective resources are deposits that yield 15 gal/ton or more and are 15 feet thick or greater. Our analysis assumes that geologically prospective federal oil shale resources that are not currently available for leasing can potentially become available for leasing in the future because they are under federal mineral rights.

Table 6. GHG emissions (GtCO₂e) from federal geologically prospective oil shale

	Volume (MMBbls)	Low	Median	High
Federal Oil Shale				
<i>Available for Lease Under PEIS and ROD & RD&D Leases</i>	75,606	24.65	26.35	28.44
<i>Total in Place Resource</i>	383,678	123.17	131.67	142.07

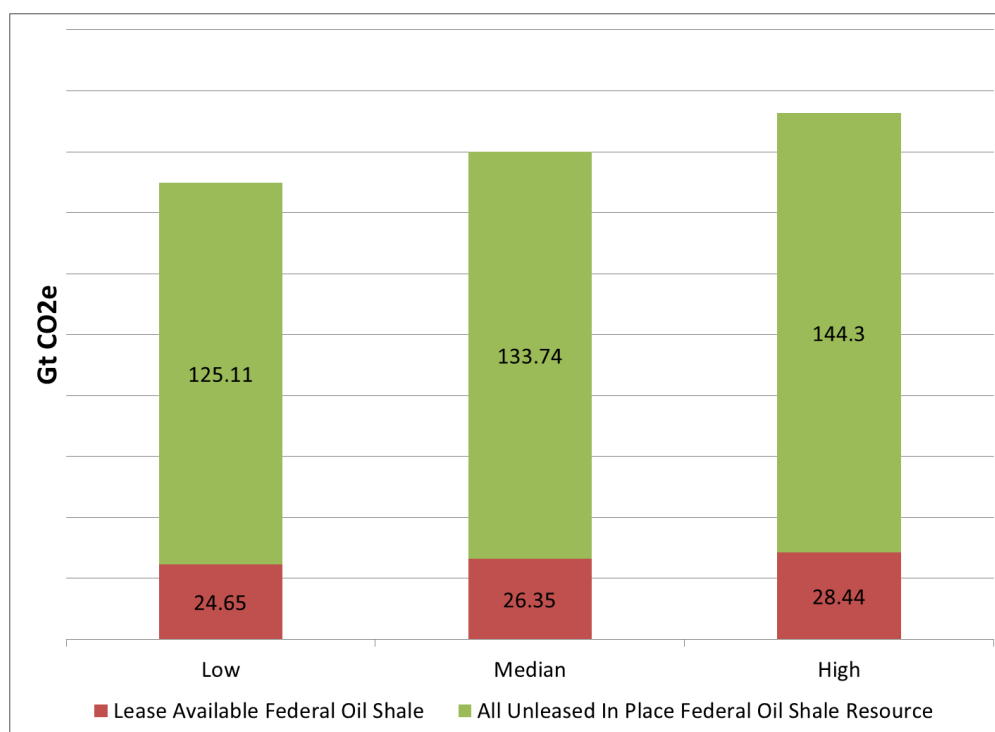


Figure 13. GHG emissions (Gt CO₂e) from federal oil shale under low, median and high emissions scenarios

Crude Oil

The potential GHG emissions of onshore and offshore federal crude oil range from 9.38 to 10.69 and 27.65 to 31.50 Gt CO₂e respectively. The potential GHG emissions of all federal crude oil range from 37.03 to 42.19 Gt CO₂e.

Table 7. GHG emissions (GtCO₂e) from federal crude oil

	Volume (MMBbls)	Low	Median	High
Unleased Federal Crude Oil				
<i>Onshore</i>	33,648	9.38	9.96	10.69
<i>Offshore</i>	74,649	27.65	29.36	31.50
<i>Total</i>	120,433	37.03	39.32	42.19

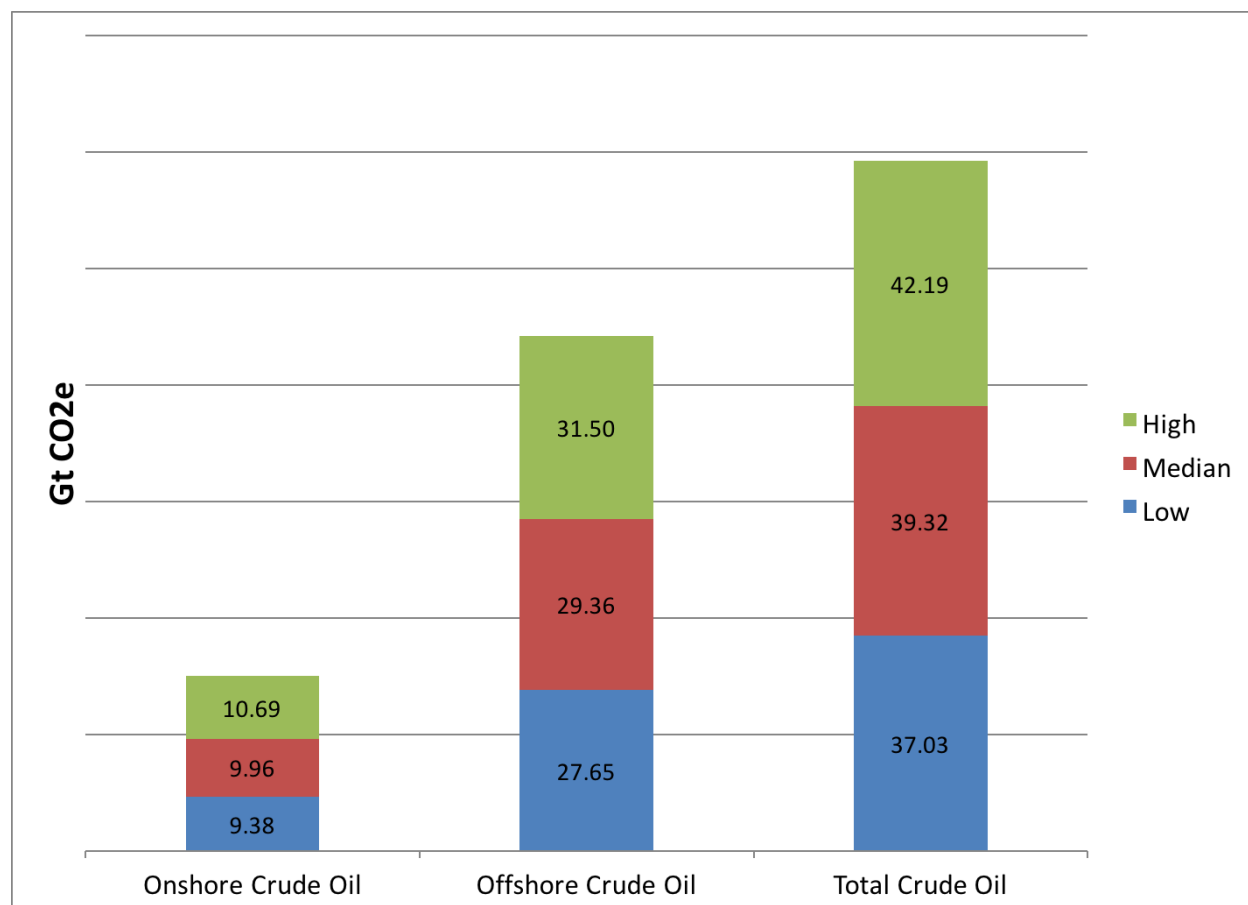


Figure 14. GHG emissions (GtCO₂e) from unleased federal crude oil

Natural Gas

Natural gas emissions were found to be 8–9% of total potential GHG emissions from federal fossil fuels.

Table 8. GHG emissions (GtCO₂e) from federal natural gas

	Volume (Tcfg)	Low	Median	High
Unleased Federal Natural Gas				
<i>Onshore</i>	231	13.79	14.61	17.21
<i>Offshore</i>	405	24.07	25.52	30.05
<i>Total</i>	635	37.86	40.13	47.26

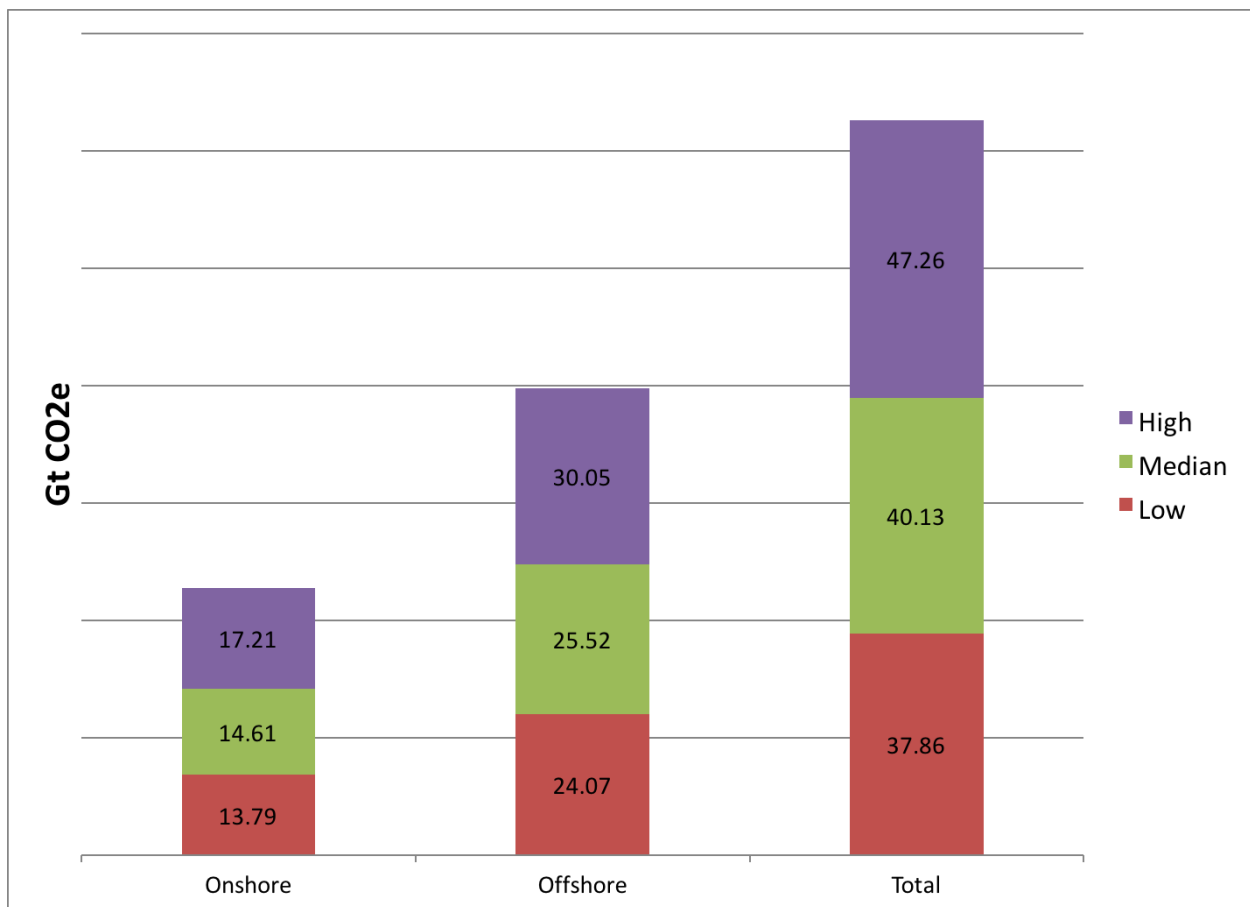


Figure 15. GHG emissions (GtCO₂e) from unleased federal natural gas

Tar Sands

Federal tar sands account for 1-2% of total potential GHG emissions from federal fossil fuels. However, it should be noted that the emissions per barrel of oil processed from tar₂₅

sands is significantly greater than that of crude oil per unit energy. Processing more tar sands into gasoline increases the GHG intensity of that fuel.

Table 9. GHG emissions (GtCO₂e) from federal tar sands

	Volume (MMBbls)	Low	Median	High
Federal Tar Sands				
<i>Lease Available</i>	4,125	1.40	1.41	1.43
<i>Total In Place Resource</i>	16,551	5.62	5.67	5.75

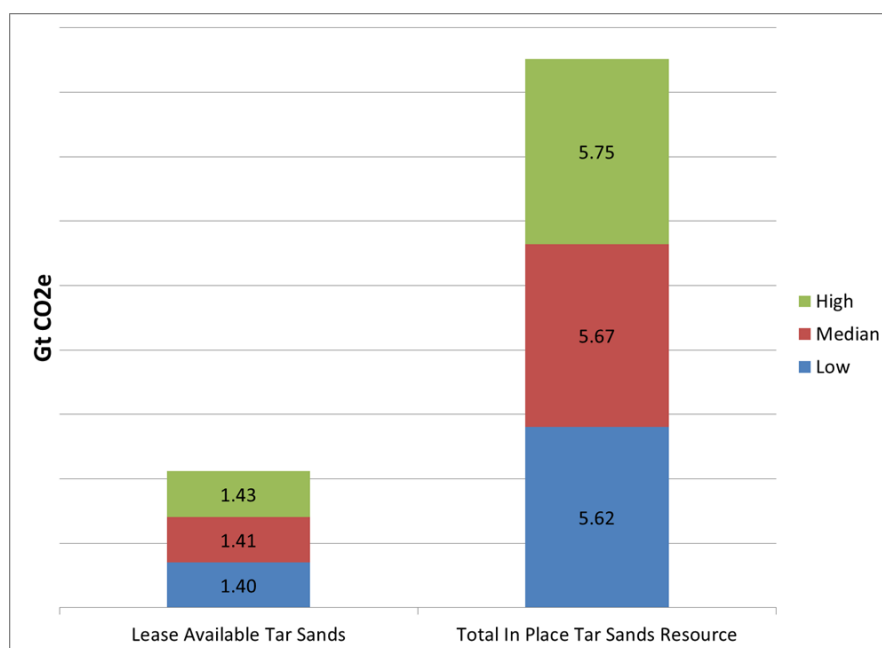


Figure 16. GHG emissions (GtCO₂e) from federal tar sands

IV. Conclusion

This report is the first to estimate the GHG emissions associated with developing federal and non-federal fossil fuels in the United States. Our results show the 100-year global warming potential of emissions resulting from the potential extraction, processing and combustion of fossil fuels under federal mineral rights. The potential GHG emissions savings associated with all federal fossil fuels, leased and unleased, is 349 to 492 GtCO₂e. Our results indicate that a cessation to new federal fossil fuel leasing could keep up to 450 Gt CO₂e from the global pool of potential future GHG emissions.

Studies that have apportioned global emissions quotas among the world's countries indicate that the U.S. share of the global emissions is limited, with varying estimates depending on the equity principles used. For example, Raupach et al. (2014) estimated three U.S. GHG emissions quota scenarios of 85 Gt CO₂e, 220 Gt CO₂e, and 356 Gt CO₂e necessary to maintain only a 50 percent likelihood of avoiding 2°C (3.6°F)

warming by century's end, depending on the equity assumptions used within a total global emissions limit. These represent a range of approximate equity assumptions for apportioning emissions quotas. Under any of those quotas, emissions from new federal fossil fuel leasing are precluded given the potential emissions from already-leased federal fossil fuels and those of non-federal fossil fuels.

Appendix I: Methodology

A1. Quantity of fossil fuels on federal lands

Determining the available fossil fuel volumes on federal lands is the starting point for analyzing the potential GHG emissions (see Appendix II: Table 1). Our approach classified fossil fuels into five broad categories: crude oil, natural gas, coal, oil shale and tar sands. We reviewed the resources used in prior research and determined that the most reliable sources for volumes of fossil fuels on federal lands are the agencies that manage them such as the Bureau of Land Management (BLM), Energy Information Agency (EIA), US Geological Survey (USGS), Office of Natural Resource Revenue (ONRR) and the Department of Interior (DOI).

Where possible we have used the volumes of fossil fuels on federal lands as they are presented in our sources. Where no volume was available, we had to estimate volumes. Onshore and offshore crude oil and natural gas under lease do not have volume estimates available. Data from the Office of Natural Resource Revenue (ONRR) on fiscal years 2014 lease volume revenue and acreage were used, alongside other fossil fuel resource data, to estimate volumes of crude oil and natural gas under lease. Oil shale available under Bureau of Land Management research, development and demonstration (RD&D) leases and its oil shale and tar sands programmatic environmental impact statement and record of decision (OSTS PEIS and ROD) do not have associated volume estimates. Volume estimates were constructed for:

- Onshore Crude Oil Under Lease
- Offshore Crude Oil Under Lease
- Onshore Natural Gas Under Lease
- Offshore Natural Gas Under Lease
- Coal Under Lease
- Oil Shale Available for Lease Under PEIS and ROD
- Oil Shale Available Under RD&D Leases
- Total In Place Federal Oil Shale Resources
- Tar Sands: In Place Federally Owned Resources
- Tar Sands: Lease Available Special Tar Sands Areas
- Unleased Federal Crude Oil
- Unleased Federal Natural Gas
- Unleased Federal Coal

- Unleased Federal Oil Shale
- Unleased Federal Tar Sands
- Non-federal fossil fuels

Onshore Crude Oil Under Lease

The 2008 EPCA inventory estimates the amount of crude oil and natural gas. We used 2014 data to estimate what portion is under active lease. To calculate onshore crude oil under lease, we use the following equation:

$$OCO_{UL} = [ONG_{AUL} \times (FLA_{TRO} \div TA_{AFL})] + OCO_{PR}$$

Where:

OCO_{UL} = Onshore Crude Oil Under Lease, in MMBls

ONG_{AUL} = Fiscal Year 2014 Oil & Natural Gas Nonproducing Acres Under Active Lease

FLA_{TRO}

= Federal lease Available Technically Recoverable Onshore Oil

TA_{AFL} = Total Acres Available for Lease from Figure ES3 of EPCA Phase 3 Inventory 2008

OCO_{PR} = Onshore Crude Oil, Proved, from EPCA Phase 3 Inventory 2008

Offshore Crude Oil Under Lease

To calculate offshore crude oil under lease, we use the following equation:

$$OFCO_{UL} = [OFA_{UAL} \times (OFCO_{LGM} \div OFCO_{LGMA})] + OFCO_{PR}$$

Where:

$OFCO_{UL}$ = Offshore Crude Oil Under Lease, in MMBbls

OFA_{UAL} = 2015 Offshore Nonproducing Acres Under Active Lease

$OFCO_{LGM}$ = Offshore Crude Oil Leased in Gulf of Mexico Nonproducing Volume

$OFCO_{LGMA}$ = Offshore Crude Oil Nonproducing Acres Leased in Gulf of Mexico

$OFCO_{PR}$ = Offshore Crude Oil, Proved, from EPCA Phase 3 Inventory 2008

Onshore Natural Gas Under Lease

To calculate onshore natural gas under lease, we use the following equation:

$$ONG_{UL} = [ONG_{AUL} \times (FLA_{TRNG} \div TA_{AFL})] + ONG_{PR}$$

Where:

ONG_{UL} = Onshore Natural Gas Under Lease, in Tcfg

ONG_{AUL} = Fiscal Year 2014 Oil and Natural Gas Nonproducing Acres Under Lease

FLA_{TRNG} = Federal Lease Available Technically Recoverable Onshore Natural Gas

TA_{AFL} = Total Acres Available for Lease from Figure ES3 of Phase 3 Inventory 2008

ONG_{PR} = Onshore Natural Gas, Proved, from EPCA Phase 3 Inventory 2008

Offshore Natural Gas Under Lease

To calculate offshore natural gas under lease, we use the following equation:

$$OFNG_{UL} = [OFA_{UAL} \times (OFNG_{LGM} \div OFNG_{NP})] + OFNG_{PR}$$

Where:

$OFNG_{UL}$ = Offshore Natural Gas Under Lease, in Tcfg
 OFA_{UAL} = Offshore Nonproducing Acres Under Active Lease
 $OFNG_{LGM}$ = Offshore Natural Gas Leased in Gulf Of Mexico Nonproducing Volume
 $OFNG_{NP}$ = Offshore Natural Gas Nonproducing Acres Leased in Gulf of Mexico
 $OFNG_{PR}$ = Offshore Natural Gas, Proved, from EPCA Phase 3 Inventory

Coal Under Lease

Since nominal amounts of coal under lease were not available, we had to estimate them based on data from GAO, BLM, and the percentage of leased and unmined coal reserves remaining in the Powder River Basin. To calculate coal under lease, we used the following equation:

$$C_L = \sum RLC [(LFC_{A,1990-2012} \div LFC_{T,1990-2012}) \times LFC_{A,2013}] \times RFC_R$$

Where:

C_L = Coal Under Lease, in MST
 $\sum RLC$ = Sum of Remaining Leased Coal for each of the following States (AL, CO, KY, MT, NM, ND, OK, UT, WY, Eastern States)
 $LFC_{A,1990-2012}$ = Leased Federal Coal in Acres (for each state) for the period 1990 – 2012, from Table 1 in GAO 2013
 $LFC_{T,1990-2012}$ = Leased Federal Coal in Tons (for each state) for the period 1990 – 2012, from Table 1 in GAO 2013
 $LFC_{A,2013}$ = Total Leased Federal Coal Acres in Effect (for each state) in 2013 from BLM 2014
 RFC_R = Percentage of leased and unmined coal reserves remaining in Powder River Basin (40.4%) from Wright 2015

Oil Shale Available for Lease Under PEIS and ROD

To calculate the volume of oil shale available for lease under both the PEIS and ROD, we separately estimate the available resource in Utah, Colorado and Wyoming, and sum these estimates.

To estimate the available resource for lease in UT, we use the following equation:

$$OSR_{UT} = AAROD_{UT} \times AR_{UT}$$

Where:

OSR_{UT} = Oil Shale Resource for lease in Utah, in MMBbls
 $AAROD_{UT}$ = Available Area in Utah According to Record of Decision
 AR_{UT} = Average Resource in Utah's Uintah Basin, in bbl/acre

To estimate the available resource for lease in CO, we use the following equation:

$$OSR_{CO} = AAROD_{CO} \times AR_{CO}$$

Where:

OSR_{CO} = Oil Shale Resource in Colorado, in MMBbls
 $AAROD_{CO}$ = Available Area in Colorado According to Record of Decision
 AR_{CO} = Average Resource in Colorado's Piceance Basin, in bbl/acre

To estimate the available resource for lease in WY, we use the following equation:

$$OSR_{WY} = AAROD_{WY} \times AR_{WY}$$

Where:

OSR_{WY} = Oil Shale Resource in Wyoming, in MMBbls
 $AAROD_{WY}$ = Available Area in Wyoming According to Record of Decision
 AR_{WY} = Average Resource in Wyoming's Green River and Washakie Basins, comprised of the average of 6 members, in bbl/acre

Oil Shale Available Under RD&D Leases

To calculate the volume of oil shale available under RD&D leases, we summed up the estimated volumes for the 9 leases detailed in the *Assessment of Plans and Progress on US Bureau of Land Management Oil Shale RD&D Leases in the United States*.¹⁴ Since volume estimates for the American Shale Oil LLC and AuraSource leases are not available in the document, we estimate them using the following equations:

$$OSR_{ASO} = AAL_{ASO} \times AR_{CO}$$

Where:

OSR_{ASO} = Oil Shale Resource in the American Shale Oil, LLC Lease, in MMBbls
 AAL_{ASO}
= Area Available For Lease (including preference right area) for the American Shale Oil, LLC lease
 AR_{CO} = Average Resource in Colorado's Piceance Basin, in bbl/acre

$$OSR_{AS} = AAL_{AS} \times AR_{UT}$$

Where:

OSR_{AS} = Oil Shale Resource in the AuraSource Lease, in MMBbls
 AAL_{AS} = Area Available For Lease (including preference right area) for the AuraSource lease
 AR_{UT} = Average Resource in Utah's Uintah Basin, in bbl/acre

Total In Place and Geologically Prospective Federal Oil Shale Resources

To calculate the total in place federal oil shale resources, we summed the federal resource available in the Piceance Basin with a yield of over 25 GPT (gallon per ton) in USGS 2010, the federal resource available in the Green River and Washakie Basins of over 15 GPT in USGS 2011, and separately estimated the federal resource available in the Uintah basin.

To estimate the federal resource in the Uintah basin, we use the following equation

$$FOSR_{UB} = AAROD_{UT} \times AR_{UT}$$

Where:

$FOSR_{UB}$ = Federal Oil Shale Resource in the Uintah Basin, in MMBbls

$AAROD_{UT}$ = Available Area in Utah According to Record of Decision

AR_{UT} = Average Resource in Uintah Basin, in bbl/acre

Tar Sands: In Place Federally Owned Resources

To calculate the volume of in place federally owned tar sands resources, we use the following equation:

$$TS_{FOR} = \sum SRfp$$

Where:

TS_{FOR} = In Place Federally Owned Tar Sands Resources, in MMBbl

$\sum SRfp$ = the sum of the federally owned percentages of tar sands resource for each state

As mentioned above, we sum the federally owned percentages of tar sands resources as listed in *Natural Bitumen Resources of the United States*.¹⁵ Where no federal ownership percentage is given in the document, we cite research by Keiter et al. 2012 for the percentage of Utah tar sands that are federal and Gorte et al. 2011 for all other states.

Tar Sands: Lease Available STSAs

To calculate the volume for Lease Available STSAs, we multiply the area available for each STSA by the resource for that area. STSA areas are taken from as presented in the 2013 ROD.¹⁶

The available resource for each area is taken from *Unconventional Energy Resources: 2013 Review*.¹⁷ This review unfortunately does not provide estimates for Raven Ridge

or San Rafael STSAs; for those, we used a low per-acre estimate (from the P.R. Spring STSA) of 25,900 barrels per acre. We then sum all of these volumes.

Unleased Federal Crude Oil

To calculate unleased federal offshore crude oil, we use the following equation:

$$OFCO_{ULL} = OFCO_{TR}$$

Where:

$OFCO_{ULL}$ = Unleased Federal Offshore Crude Oil

$OFCO_{TR}$ = Technically Recoverable Federal Offshore Crude Oil

To calculate unleased federal onshore crude oil, we use the following equation:

$$OCO_{ULL} = OCO_{TR}$$

Where:

OCO_{ULL} = Unleased Federal Onshore Crude Oil

OCO_{TR} = Technically Recoverable Federal Onshore Crude Oil

Unleased Federal Natural Gas

To calculate unleased federal offshore natural gas, we use the following equation:

$$OFNG_{ULL} = OFNG_{TR}$$

Where:

$OFNG_{ULL}$ = Unleased Federal Offshore Natural Gas

$OFNG_{TR}$ = Technically Recoverable Federal Offshore Natural Gas

To calculate unleased federal onshore natural gas, we use the following equation:

$$ONG_{ULL} = ONG_{TR}$$

Where:

ONG_{ULL} = Unleased Federal Onshore Natural Gas

ONG_{TR} = Technically Recoverable Federal Onshore Natural Gas

Unleased Federal Coal

To calculate unleased federal coal, we use the following equation:

$$FC_{ULL} = FC_{RR} - \left\{ \left(\frac{FC_{TIR}}{BLM_{AUM}} \right) \times CLA_{2013} \right\}$$

Where:

FC_{ULL} = Unleased Federal Coal

FC_{RR} = Federal Recoverable Coal Reserves from NMA 2012

FC_{TIR} = Total Federal In Place Coal Resource from USDA, USDOE, USDOJ 2007

BLM_{AUM} = Acres Under BLM Management from BLM 2014

CLA_{2013} = 2013 Leased Coal Acres from BLM 2014

Unleased Federal Oil Shale

To calculate unleased federal oil shale, we subtract Federal Oil Shale Available under RD&D Leases from DOE/BLM 2013 from Total In Place Geologically Prospective Federal Oil Shale Resources as described earlier.

Unleased Federal Tar Sands

To calculate unleased federal tar sands, we assume the total in place federal tar sands resources are unleased.

Non-federal Fossil Fuels

Non-federal fossil fuels volumes are calculated for each fossil fuel category by subtracting federal fossil fuel volumes from total technically recoverable oil resources, total technically recoverable natural gas resources, and total us recoverable coal reserves in the U.S. as provided by EIA 2012a. There are no non-federal tar sands and oil shale resources studied in this study.

For each oil, natural gas and coal resource:

$$NFFF = TTR - FFF$$

Where:

$NFFF$ = Non-federal Fossil Fuel

TTR = Total Technically Recoverable Resource

FFF = Federal Fossil Fuel

A2. Fossil Fuel to Primary Energy Conversions

We converted volumes of fossil fuels into primary energy as this allowed us to make necessary adjustments and apply resource specific life-cycle GHG emissions factors, as those are presented in units of energy. For example, the life-cycle GHG emissions factors are typically on a product-delivered basis (kWh of electricity, MJ of thermal energy), so the fossil fuel reserves must be adjusted because only a portion of the fossil fuel becomes a final product delivered.



Figure A17. Determining quantities of energy to multiply by emissions factor

We used the following assumptions to convert fossil fuel amounts to primary energy:

Table A10. Energy content of fossil fuels

Fossil Fuel	Energy Content	Source
Crude Oil	5,746 MJ / barrel (LHV)	ORNL 2011
Natural Gas	983 btu / ft ³ (LHV)	ORNL 2011
Coal	20.61 btu / ton (HHV)	ORNL 2011
Oil Shale	5,746 MJ / barrel (LHV)	ORNL 2011
Tar Sands	5,746 MJ / barrel (LHV)	ORNL 2011

Proportions of Resource Used as Input for End-use Products

The proportions of resource used as input for end-use products were needed in order to appropriately divide the initial fossil fuel amounts. The proportions make it possible to apply end-use product specific life-cycle emissions factors, which account for the full

life-cycle GHG emissions associated with each end-use product. These proportions do not take into account the energy required to process the fossil fuel resource and move it downstream. They only describe a percentage of the fossil fuel resource that will ultimately be used in end-use products and sectors.

Crude Oil

Proportions of Crude Oil used for various end-use products were derived from the EIA.¹⁸ To calculate proportions each of the top seven petroleum products consumed in 2013 was divided by the total annual consumption of petroleum products. These top seven products are:

- Finished Motor Gasoline
- Distillate Fuel Oil
- Kerosene
- Liquefied Petroleum Gases (LPG)
- Petroleum Coke
- Still Gas
- Residual Fuel Oil

Dividing the consumption of each end product by the total annual consumption of petroleum products enabled us to reconstruct the demand for petroleum products, and thus the hypothetical product output of a crude oil refinery.

For this method, we used the following equation:

$$CO_{EUPP} = AC_{EUP} \div AC_{APP}$$

Where:

CO_{EUPP} = Crude Oil End Use Product Proportion
 AC_{EUP} = Annual Consumption of End Use Product
 AC_{APP} = Annual Consumption of All Petroleum Products

Natural Gas

Proportions of Natural Gas used for each end-use sector were derived from the EIA's *Natural Gas Consumption by Sector in the Reference case, 1990-2040: History: U.S. Energy Information Administration, Monthly Energy Review*.¹⁹ For each end-use sector, the sector specific annual natural gas consumption was divided by the total annual natural gas consumption. These end-use sectors are:

- Residential
- Commercial
- Industrial
- Electric Power
- Transportation

For this method we used the following equation:

$$NG_{EUSP} = AC_{EUS} \div AC_{ANG}$$

Where:

NG_{EUSP} = Natural Gas End Use Sector Proportion

AC_{EUS} = Annual Consumption by End Use Sector

AC_{ANG} = Annual Consumption of All Natural Gas

Coal

Proportions of Coal used for each end-use sector were derived from the EIA's *Quarterly Coal Report – April – June 2014: Table 32 - U.S. Coal Consumption by End-Use Sector, 2008 – 2014*.²⁰ For each end-use sector, the sector specific annual coal consumption was divided by the total annual coal consumption. These end-use sectors are:

- Electric Power
- Coke
- Other Industrial Use

For this method, we use the following equation:

$$C_{EUSP} = AC_{EUS} \div AC_{AC}$$

Where:

C_{EUSP} = Coal End Use Sector Proportion

AC_{EUS} = Annual Consumption by End Use Sector

AC_{AC} = Annual Consumption of All Coal

Oil Shale

For oil shale we assume the same end-use products will be refined from a barrel of crude oil derived from oil shale. We apply the same end-use product proportions as calculated for Crude Oil.

Tar Sands

For tar sands we assume the same end-use products will be refined from a barrel of crude oil derived from tar sands as has been assumed in other research.²¹ We apply the same end-use product proportions as calculated for Crude Oil.

Primary Energy Factors

Making energy products requires energy. To account for the energy in the reserve required to make the final end products, we determined a ratio of primary energy to the end use, resulting in a Primary Energy Factor. The Primary Energy Factor represents the relationship between the amount of energy required to make the end product and the amount of end product. In the case of coal-based electricity, it is the amount of energy needed to make 1 kWh of coal fired electricity, which will always be >1 kWh. For this study only about 30% of the total coal resource becomes electricity delivered from coal-fired generation; it requires about 3.3 kWh of coal resource to make and deliver 1 kWh of coal electricity. Our methodology assumes the energy required to process the fossil fuel resource into the end product is internal, meaning it comes from the resource. This means that some portion of the fossil fuel resource is consumed making the fossil fuel product. The primary energy factor helps understand the total amount of fossil fuel products and has no impact on the life-cycle GHG emissions, which are accounted for in the emissions factors.

For many end products, primary energy factors are available, as “source energy factors” from the National Renewable Energy Laboratory’s *Fuels and Energy Precombustion LCI Data Module*.²² We used these source energy factors, which represent the energy required to extract, process, and deliver fuel, as Primary Energy Factors. We used NREL’s ‘source energy factors’ for all end products except:

- Natural Gas Use in the Electric Power Sector
- Coal Use in the Electric Power Sector
- Coal Use in manufacturing Metallurgical Coke
- Coal Use in Other Industrial Use
- End Products Derived from Oil Shale and Tar Sands

Natural Gas Use in the Electric Power Sector

To calculate the Primary Energy Factor for Natural Gas Use in the Electric Power Sector, we converted the volume (ft³) of Natural Gas delivered in 2013 to customers in the Electric Power Sector from EIA’s *February 2015 Monthly Energy Review*²³ into kWh, took the 2013 net electrical generation from Natural Gas (kWh) by Electric Power Sector customers in EIA’s *February 2015 Monthly Energy Review*,²⁴ and the source energy factor for Natural Gas from Deru and Torcellini 2007.

To calculate the Primary Energy Factor for Natural Gas Use in the Electric Power Sector, we used the following equation:

$$PEFNG_{EPS} = NGD_{EPS} \div NEGNG_{EPS}$$

Where:

PEFNG_{EPS} = Primary Energy Factor for Natural Gas Use in the Electric Power Sector

NGD_{EPS} = Natural Gas Delivered to Electric Power Sector Customers in 2013

NEGNG_{EPS} = Net Electrical Generation from Natural Gas by Electric Power

For other Natural Gas end-use sectors, we assume all heat not converted to electricity is useful. For the Electric Power Sector, however, we assume all heat is lost.

Coal Use in the Electric Power Sector

For Coal Use in the Electric Power Sector, we converted the quantity of coal consumed by the Electric Power Sector in *Quarterly Coal Report – April – June 2014: Table 32 - U.S. Coal Consumption by End-Use Sector, 2008 – 2014*²⁵ into kWh, we took the 2013 net electrical generation from Coal (kWh) by Electric Power Sector customers in EIA’s *February 2015 Monthly Energy Review (2015b)*, and the source energy factor for Coal.²⁶

To calculate the Primary Energy for Coal Use in the Electric Power Sector, we used the following equation:

$$PEFC_{EPS} = CD_{EPS} \div NEGC_{EPS}$$

Where:

$PEFC_{EPS}$ = Primary Energy Factor for Coal Use in the Electric Power Sector

CD_{EPS} = Coal Delivered to Electric Power Sector Customers in 2013

$NEGC_{EPS}$ = Net Electrical Generation from Coal by Electric Power Customers in 2013

For Coal Use in the manufacture of Metallurgical Coke, we used values in World Coal Association 2015. For Coal Use in Other Industrial Use, we use the same Primary Energy Factor as that calculated for Coal Use in the Electric Power sector.

End Products Derived From Oil Shale and Tar Sands

The primary energy resource available for end products derived from oil shale and tar sands needs to be adjusted for the increased energy required to extract and process both the oil shale and tar sands. We assume the additional energy required for these processes comes from the primary energy resource itself, otherwise referred to as ‘internal’ energy. Since the primary energy factors used²⁷ are aggregates of several components (exploration, extraction, processing, and refining into end products), and do not list the primary energy factors for each of these components, we had to disaggregate the factors and backwards calculate the primary energy factor of just the refining component. To do this we use the following equation for each end product derived from crude oil:

$$PEFCO_{REP} = (PEFCO_{EP}) - \left(\frac{1}{EROI_{CO}}\right)$$

Where:

$PEFCO_{REP}$

= Primary Energy Factor of Refining the End Product From Crude Oil, exclusive of energy required for exploration, extraction, and processing

$PEFCO_{EP}$ = Primary Energy Factor of End Product, inclusive of all processes

$EROI_{CO}$ = Energy Return On Investment from Crude Oil

For End Products Derived from Oil Shale, we adjust the Primary Energy Factors of refining components of end products derived from Crude Oil by the following adjustment mechanism:

$$PEFOS_{EP} = PEFCO_{REP} + \left(\frac{1}{EROI_{OS}} \right)$$

Where:

$PEFOS_{EP}$ = Primary Energy Factor of Oil Shale Derived End Product

$PEFCO_{REP}$ = Primary Energy Factor of Refining Component of End Product

$EROI_{OS}$ = Energy Return ON Investment from Oil Shale, from Brand 2009

For End Products Derived from Tar Sands, we adjust the Primary Energy Factors of refining components of end products derived from Crude Oil by the following adjustment mechanism:

$$PEFTS_{EP} = PEFCO_{REP} + \left(\frac{1}{EROI_{TS}} \right)$$

Where:

$PEFOS_{EP}$ = Primary Energy Factor of Oil Shale Derived End Product

$PEFCO_{REP}$ = Primary Energy Factor of Refining Component of End Product

$EROI_{OS}$ = Energy Return ON Investment from Oil Shale²⁸

Emissions Factors

The approach used in this study was to use emissions factors that represent the functional units for which we had data on fossil fuels amounts. For example, if the functional unit of the emissions factor was a kWh worth of electricity, we estimated the total amount of resource that can be converted into this functional unit. Where the emissions factor is provided on an energy unit basis that is not equivalent to that of the fossil fuel resource, we make the appropriate conversion.

All life-cycle emissions factors used in this study, and nearly all in the literature, are on an end-use product basis (i.e., kWh of electricity, MJ of final fuel combusted, km-travelled, etc.). To account for the energy in the feedstock required to make the end-use products, we determined a ratio of primary energy to the end-use product, as described 40

earlier in this Appendix. This represents the relationship between the amount of energy required to make the final product.

We were able to find resource-specific life-cycle emissions factors for all fossil fuel categories. These life-cycle emissions factors account for the greenhouse gas emissions associated with all life-cycle stages associated with the production of an end product derived from a fossil fuel feedstock.

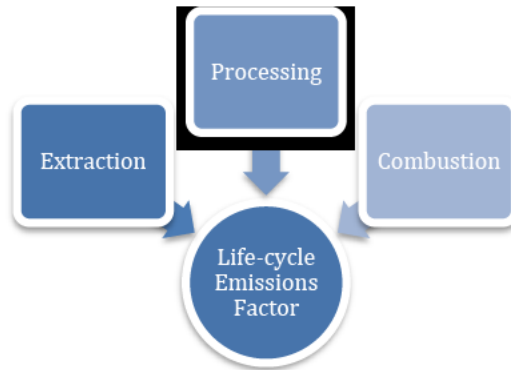


Figure A18. Example life-cycle stages accounted for in a life-cycle emissions factor

For each emissions factor we evaluated low, median and high emission factor scenarios. The base case in this study is the low emissions factor scenario, which is the most conservative estimate of the GHG emissions from developing fossil fuels. This was done to account for a static emissions factor; we optimistically assume that GHG emissions per unit energy improve over time compared to *ex post* emissions factors in the literature as more efficient energy and public policy and best practices limit fugitive emissions.

Where possible we used harmonized life-cycle emissions factors found in the literature. Harmonization is a meta-analytical process used to develop robust, analytically consistent and current comparisons of estimates of life-cycle GHG emissions factors, which have been scientifically studied and published in academic, peer-reviewed literature.

For some end-use products, however, specific emissions factors were not available in the literature. We make adjustments to the emissions factors for the following:

- Natural Gas extracted from non-conventional, shale based natural gas resource
- All end products (except Gasoline) derived from Oil Shale
- LPG, Petroleum Coke, Still Gas, and Residual Fuel Oil derived from Tar Sands
- Natural Gas Used in the Transportation Sector

Natural Gas Extracted From Non-Conventional, Shale-based Natural Gas Resource

To account for the difference in emissions resulting from conventional natural gas extraction and non-conventional natural gas extraction, we apply shale-gas specific emissions-factors to a percentage of the total Natural Gas fossil fuel volume. We assume this to be 27% and take this figure from EIA's *Technically Recoverable Shale Oil and Shale Gas Resources: An Assessment of 137 Shale Formations in 41 Countries Outside the United States* (2013). We use shale-gas specific emissions factors from Burnham et al. 2012 and Heath et al. 2014.

All End Products (Except Gasoline) Derived From Oil Shale

Specific emissions factors for finished motor gasoline derived from oil shale was available in the literature. Emissions factors for the remainder of the end products, however, were not.

To account for the difference in emissions between conventional crude oil extraction and processing and the extraction and processing of Oil Shale into an equivalent barrel of standard crude oil, we adjust the end product specific emissions factors using the following equation:

$$OSE_{AF} = (FMG_{OS} - FMG_{CO}) \div FMG_{CO}$$

Where:

OSE_{AF} = Oil Shale Emissions Adjustment Factor

FMG_{OS} = Finished Motor Gasoline from Oil Shale Emissions Factor from Brandt 2009

FMG_{CO} = Finished Motor Gasoline from Crude Oil Emissions Factor from Burnham, et al. 2012

We then multiply each crude oil end product specific emissions factor by $(1 + OSE_{AF})$ to appropriately increase the emissions factor due to the increased emissions resulting from Oil Shale extraction and processing. The emissions factor from Brandt 2009 used above is an Oil Shale specific emissions factor.

LPG, Petroleum Coke, Still Gas and Residual Fuel Oil Derived From Tar Sands

Specific emissions factors for finished motor gasoline, distillate fuel oil and kerosene were available in the literature. However, specific emissions factors for other end-use products were not. To account for the difference in emissions between conventional crude oil extraction and processing and the extraction and processing of Tar Sands into an equivalent barrel of standard crude oil, we adjust the end product specific emissions factors using the following equation:

TSE_{AF} = the average of:

$$(FMG_{TS} - FMG_{CO}) \div FMG_{CO};$$

$$(DFO_{TS} - DFO_{CO}) \div DFO_{CO};$$

and

$$(K_{TS} - K_{CO}) \div K_{CO}$$

Where:

TSE_{AF} = Tar Sands Emissions Adjustment Factor

FMG_{TS} = Finished Motor Gasoline from Tar Sands Emissions Factor²⁹

FMG_{CO} = Finished Motor Gasoline from Crude Oil Emissions Factor³⁰

DFO_{TS} = Distillate Fuel Oil from Tar Sands Emissions Factor³¹

DFO_{CO} = Distillate Fuel Oil from Crude Oil Emissions Factor³²

K_{TS} = Kerosene from Tar Sands Emissions Factor³³

K_{CO} = Kerosene from Crude Oil Emissions Factor³⁴

We then multiply the LPG, Petroleum Coke, Still Gas and Residual Fuel Oil from Crude Oil emissions factors by $(1 + TSE_{AF})$.

Natural Gas Used in the Transportation Sector

In order to more accurately estimate the emissions from natural gas use in the transportation sector, we use EIA data³⁵ to determine what percentage of natural gas is used by light duty compressed natural gas (CNG) vehicles, and what percentage is used by medium and heavy duty CNG vehicles. We then apply these proportions to the transportation portion of natural gas primary energy volumes.

To calculate GHG emissions, we use life-cycle emissions factors for CNG transportation.³⁶ Since the emissions factors from Burnham et al. are measured in km-travelled, we need the fuel economy to determine the distance each mode of transport can travel based upon a unit of gas. We use EPA data to estimate the fuel economy of light duty vehicles.³⁷ For the fuel economy of medium and heavy duty vehicles, we cite research from NREL.³⁸ Once energy available is expressed in the functional units of the life-cycle emissions factors, we can estimate potential GHGs.

Research Limitations

There are several limitations to this model. The major limitation is the unavailability of some kinds of data that would allow for a better approximation of global warming potential from developing fossil fuels. For example, tar sands reserves are not well characterized as amounts are reported in “acres” and estimates must be made by applying a “barrel per acre” estimate instead of absolute amounts, which would be easier to compare with other reserves. In addition, existing fossil fuel amounts under lease were mostly unavailable. There is also no specific data for all of the crude oil end products. Literature on life-cycle emissions factors for oil shale and tar sands not as extensive as for other resources and come with higher ranges of uncertainty. There is also no federal ownership of figures for Tar Sands in Alabama, Texas, California, Kentucky, New Mexico, Wyoming and Oklahoma. Finally, emissions factors used in this study were static over time and based on *ex post* (actual) data. Our GHG emissions

model assumes that the combustion efficiency or GHG intensity across the fleet of U.S. fossil fuel-fired power plants remains static over time.

Appendix II: Data Sources

Table A11. Fossil fuel amounts and sources

Fossil Fuel Type	Quantity	Source(s) Used
Crude Oil		
Offshore		
Federal Technically Recoverable	89,930 MMBbls	BOEM 2014
Federal Proved (2013)	5,137 MMBbls	EIA 2015a
FY 2014 Crude Oil Volume Revenues Reported	396.36 MMBbls	ONRR 2014
February 2015 Producing Leases – Acreage	4,980,054 acres	BOEM 2015
Acreage Under Active Lease	32,184,001 acres	BOEM 2015
Leased in Gulf of Mexico (non-producing/not subject to exploration & development plans)	17,900 MMBbls	DOI 2012
Non-producing Acreage Leased in Gulf of Mexico	23,849,584 acres	BOEM 2015
All Non-producing Acreage Leased	27,203,947 acres	DOI 2012
Onshore		
Federal Technically Recoverable	30,503 MMBbls	EPCA Phase 3 Inventory 2008
Federal Lease Available Technically Recoverable*	18,989 MMBbls	EPCA Phase 3 Inventory 2008
Federal Proved	5,344 MMBbls	EPCA Phase 3 Inventory 2008
FY 2014 Crude Oil Volume Revenues Reported	146.23 MMBbls	ONRR 2014
FY 2014 O&NG Producing Leases – Acreage	12,690,806 acres	BLM 2014a
FY 2014 O&NG Acres Under Lease	34,592,450 acres	BLM 2014a
Total Technically Recoverable Resource	220,200 MMBbls	EIA 2012a
Natural Gas		
Offshore		
Technically Recoverable	404.52 Tcfg	BOEM 2014
Federal Proved Gas	25.33 Tcfg	EIA 2014c
FY 2014 Natural Gas Volume Revenues Reported	0.85 Tcfg	ONRR 2014
February 2015 Producing Leases – Acreage	4,980,054 acres	BOEM 2015
Acreage Under Active Lease	32,184,001 acres	BOEM 2015
Leased in Gulf of Mexico (non-producing/not subject to exploration & development plans)	49.70 Tcfg	DOI 2012
Non-producing Acreage Leased in Gulf of Mexico	23,849,584 acres	BOEM 2015
All Non-producing Acreage Leased	27,203,947 acres	BOEM 2015
Onshore		
Technically Recoverable	230.98 Tcfg	EPCA Phase 3 Inventory 2008
Lease Available Technically Recoverable*	194.907 Tcfg	EPCA Phase 3 Inventory 2008
Proved Gas	68.76 Tcfg	EPCA Phase 3 Inventory 2008

Total Technically Recoverable Resource	2,203.30 Tcfg	EIA 2012a
Coal		
In Place Federal Coal Resources	957,000 MST	USDA, DOE, DOI 2007
Federal Recoverable Coal Reserves	87,000 MST	National Mining Association 2012
Total U.S. Recoverable Reserves	256,000 MST	EIA 2012b
2013 Leased Coal Acres	474,025 acres	BLM 2014b
2013 Coal Production	422.25 MST	ONRR 2013
Oil Shale		
Available Area According to ROD – UT*	360,400 acres	BLM ROD 2013
Available Area According to ROD – CO*	26,300 acres	BLM ROD 2013
Available Area According to ROD – WY*	292,000 acres	BLM ROD 2013
Average Resource – UT	74,093 bbl/acre	BLM OSTS 2012
Average Resource – WY	120,117 bbl/acre	BLM OSTS 2012
Average Resource – CO	300,000 bbl/acre	Mercier, et al. 2010
Resource Available in Piceance Basin	284,800 MMBbls	USGS 2010
Resource Available in Green River and Washakie Basins	72,179 MMBbls	USGS 2011
Resource Available in Uinta Basin	26,699 MMBbls	BLM OSTS 2012; BLM ROD 2013
Available Under RD&D Leases	5,938 MMBbls	DOE/BLM 2013
Tar Sands		
In Place Tar Sands Resources	54,095 MMBbls	USGS 2006
Federal Ownership of Utah Tar Sands	58%	Keiter et al. 2011
Federal Ownership of Other Tar Sands	28%	Gorte et al. 2012
Lease Available STSAs*	4,125 MMBbls	BLM OSTS 2012

* “Lease-available” federal fossil fuels are unleased federal fossil fuels that are available for leasing under current federal policies and plans.

Table A12. End-use products/sectors and life-cycle emissions factor sources

End-use Product / Sector	Key Parameter(s) for Influencing Low, Median, High Emissions Scenarios	Life-Cycle Emission Factor Source(s) Used
<u>Crude Oil</u>		
Gasoline	Associated gas venting and flaring; vehicle end-use efficiency	Burnham et al. 2012
Distillate Fuel Oil	Extraction and transport	NETL 2008, 2009 as cited in US DOS 2014
Kerosene	Extraction and transport	NETL 2008, 2009 as cited in US DOS 2014
Liquefied Petroleum Gases (LPG)	Extraction and transport	Venkatesh et al. 2010
Petroleum Coke	Extraction and transport	Venkatesh et al. 2010
Still Gas	Extraction and transport	Venkatesh et al. 2010
Residual Fuel Oil	Extraction and transport	Venkatesh et al. 2010
<u>Natural Gas</u>		
Residential	Liquid unloadings (venting); well equipment (leakage and venting); transmission and distribution (leakage and venting)	Burnham et al. 2012
Commercial	Liquid unloadings (venting); well equipment (leakage and venting); transmission and distribution (leakage and venting)	Burnham et al. 2012
Industrial	Liquid unloadings (venting); well equipment (leakage and venting); transmission and distribution (leakage and venting)	Burnham et al. 2012
Electric Power	Power conversion efficiency	Heath et al. 2014
Transportation	Liquid unloadings (venting); well equipment (leakage and venting); transmission and distribution (leakage and venting)	Burnham et al. 2012
<u>Coal</u>		
Electric Power	Transmission and distribution losses; power conversion efficiency; coal mine methane	Whitaker et al. 2012
Coke		EPA 2004
Other Industrial Use	Transmission and distribution losses; power conversion efficiency; coal mine methane	Whitaker et al. 2012
<u>Oil Shale</u>		
Gasoline	Retorting; upgrading; refining	Brandt 2009
Distillate Fuel Oil	Retorting; upgrading; refining; extraction	Brandt 2009; Burnham et al. 2012; NETL 2008, 2009 as cited in US DOS 2014
Liquefied Petroleum Gases (LPG)	Retorting; upgrading; refining; extraction; transport	Brandt 2009; Burnham et al. 2012; Venkatesh et al. 2010
Kerosene	Retorting; upgrading; refining; extraction; transport	Brandt 2009; Burnham et al. 2012; NETL 2008, 2009 as cited in US DOS 2014
Petroleum Coke	Retorting; upgrading; refining;	Brandt 2009; Burnham et al. 2012;

	extraction; transport	Venkatesh et al. 2010
Still Gas	Retorting; upgrading; refining; extraction; transport	Brandt 2009; Burnham, et al. 2012; Venkatesh et al. 2010
Residual Fuel Oil	Retorting; upgrading; refining; extraction; transport	Brandt 2009; Burnham et al. 2012; Venkatesh et al. 2010
Tar Sands		
Gasoline	Feedstock mixture (consisting of dilbit, synthetic crude oil, bitumen)	Jacobs 2009, NETL 2008, 2009, and TIAx 2009 as cited in DOS 2014
Distillate Fuel Oil	Feedstock mixture (consisting of dilbit, synthetic crude oil, bitumen)	Jacobs 2009, and NETL 2008, 2009 as cited in DOS 2014
Liquefied Petroleum Gases (LPG)	Feedstock mixture (consisting of dilbit, synthetic crude oil, bitumen)	Jacobs 2009, NETL 2008, 2009, and TIAx 2009 as cited in US DOS 2014; Venkatesh et al. 2010
Kerosene	Feedstock mixture (consisting of dilbit, synthetic crude oil, bitumen)	NETL 2008, 2009 as cited in DOS 2014
Petroleum Coke	Feedstock mixture (consisting of dilbit, synthetic crude oil, bitumen)	Jacobs 2009, NETL 2008, 2009, and TIAx 2009 as cited in DOS 2014; Venkatesh et al. 2010
Still Gas	Feedstock mixture (consisting of dilbit, synthetic crude oil, bitumen)	Jacobs 2009, NETL 2008, 2009, and TIAx 2009 as cited in DOS 2014; Venkatesh et al. 2010
Residual Fuel Oil	Feedstock mixture (consisting of dilbit, synthetic crude oil, bitumen)	Jacobs 2009, NETL 2008, 2009, and TIAx 2009 as cited in DOS 2014; Venkatesh et al. 2010

Table A13. Crude oil end products and emissions factors

Crude Oil End-use Product	Proportion of Resource Used as Input for End-use Product	Carbon Storage Factor	Low Emissions Factor	Median Emissions Factor	High Emissions Factor	Primary Energy Factor
Finished Motor Gasoline	46.46%	0.00	86 tons CO ₂ e / TJ Fuel Combusted	92 tons CO ₂ e / TJ Fuel Combusted	98 tons CO ₂ e / TJ Fuel Combusted	1.19
Distillate Fuel Oil	17.92%	0.50	89 tons CO ₂ e / TJ Fuel Combusted	90 tons CO ₂ e / TJ Fuel Combusted	96 tons CO ₂ e / TJ Fuel Combusted	1.16
Kerosene	7.51%	0.00	86 tons CO ₂ e / TJ Fuel Combusted	88 tons CO ₂ e / TJ Fuel Combusted	91 tons CO ₂ e / TJ Fuel Combusted	1.21
Liquefied Petroleum Gases	12.75%	0.59	80 tons CO ₂ e / TJ Fuel Combusted	88 tons CO ₂ e / TJ Fuel Combusted	100 tons CO ₂ e / TJ Fuel Combusted	1.15
Petroleum Coke	1.87%	0.30	130 tons CO ₂ e / TJ Fuel Combusted	144 tons CO ₂ e / TJ Fuel Combusted	160 tons CO ₂ e / TJ Fuel Combusted	1.05
Still Gas	3.72%	0.59	78 tons CO ₂ e / TJ Fuel Combusted	87 tons CO ₂ e / TJ Fuel Combusted	100 tons CO ₂ e / TJ Fuel Combusted	1.09
Residual Fuel Oil	1.70%	0.00	88 tons CO ₂ e / TJ Fuel Combusted	95 tons CO ₂ e / TJ Fuel Combusted	110 tons CO ₂ e / TJ Fuel Combusted	1.19
Asphalt*	1.71%	1.00		--		--
Other Oils*	0.56%	1.00		--		--
Lubricants*	0.64%	1.00		--		--
Other*	5.16%	1.00		--		--

Table A14. Natural gas end-use sectors and factors

Natural Gas End-use Sector (product)	Proportion of Resource Used as Input for End-use Product	Primary Energy Yield Factor	Low Emissions Factor	Median Emissions Factor	High Emissions Factor	Primary Energy Factor
Residential (CHP)	18.76%	100%	72 tons CO ₂ e / MJ of fuel combusted	76 tons CO ₂ e / MJ of fuel combusted	81 tons CO ₂ e / MJ of fuel combusted	1.092
Commercial (CHP)	12.44%	100%	72 tons CO ₂ e / MJ of fuel combusted	76 tons CO ₂ e / MJ of fuel combusted	81 tons CO ₂ e / MJ of fuel combusted	1.092
Industrial (CHP)	34.14%	100%	72 tons CO ₂ e / MJ of fuel combusted	76 tons CO ₂ e / MJ of fuel combusted	81 tons CO ₂ e / MJ of fuel combusted	1.092
Electric Power (kWh)	31.69%	43.39%	117 tons CO ₂ e / MJ of fuel combusted	125 tons CO ₂ e / MJ of fuel combusted	180 tons CO ₂ e / MJ of fuel combusted	1.092
Transportation (km-travelled)	2.98%	100%	210 grams CO ₂ e / km travelled	230 grams CO ₂ e / km travelled	250 grams CO ₂ e / km travelled	1.092

Table A15. Coal end-use sectors and factors

Coal End-use Sector (product)	Proportion of Resource Used as Input for End-use Product	Primary Energy Yield Factor	Low Emissions Factor	Median Emissions Factor	High Emissions Factor	Primary Energy Factor
Electric Power (kWh)	92.78%	31.65%	203 tons CO ₂ e / TJ of fuel combusted	272 tons CO ₂ e / TJ of fuel combusted	381 tons CO ₂ e / TJ of fuel combusted	1.048
Metallurgical Coke (pig iron)	2.32%	n/a		1.35 tons of CO ₂ e / ton of pig iron produced		1.167
Other Industrial Use (kWh)	4.89%	31.65%	203 tons CO ₂ e / TJ of fuel combusted	272 tons of CO ₂ e / TJ of fuel combusted	381 tons CO ₂ e / TJ of fuel combusted	1.048

Table A16. Oil shale end-use products and factors

Oil Shale End-use Product	Proportion of Resource Used as Input for End-use Product	Carbon Storage Factor	Low Emissions Factor	Median Emissions Factor	High Emissions Factor	Primary Energy Factor
Finished Motor Gasoline	46.46%	0.00	130 tons CO ₂ e / TJ Fuel Combusted	141 tons CO ₂ e / TJ Fuel Combusted	150 tons CO ₂ e / TJ Fuel Combusted	1.187
Distillate Fuel Oil	17.92%	0.50	135 tons CO ₂ e / TJ Fuel Combusted	138 tons CO ₂ e / TJ Fuel Combusted	147 tons CO ₂ e / TJ Fuel Combusted	1.158
Kerosene	7.51%	0.00	130 tons CO ₂ e / TJ Fuel Combusted	135 tons CO ₂ e / TJ Fuel Combusted	139 tons CO ₂ e / TJ Fuel Combusted	1.205
Liquefied Petroleum Gases	12.75%	0.59	121 tons CO ₂ e / TJ Fuel Combusted	135 tons CO ₂ e / TJ Fuel Combusted	153 tons CO ₂ e / TJ Fuel Combusted	1.151
Petroleum Coke	1.87%	0.30	197 tons CO ₂ e / TJ Fuel Combusted	221 tons CO ₂ e / TJ Fuel Combusted	245 tons CO ₂ e / TJ Fuel Combusted	1.048
Still Gas	3.72%	0.59	118 tons CO ₂ e / TJ Fuel Combusted	133 tons CO ₂ e / TJ Fuel Combusted	153 tons CO ₂ e / TJ Fuel Combusted	1.092
Residual Fuel Oil	1.70%	0.00	133 tons CO ₂ e / TJ Fuel Combusted	146 tons CO ₂ e / TJ Fuel Combusted	168 tons CO ₂ e / TJ Fuel Combusted	1.191
Asphalt*	1.71%	1.00		--		--
Other Oils*	0.56%	1.00		--		--
Lubricants*	0.64%	1.00		--		--
Other*	5.16%	1.00		--		--

Table A17. Tar sands end-use products and factors

Tar Sands End-use Product	Proportion of Resource Used as Input for End-use Product	Carbon Storage Factor	Low Emissions Factor	Median Emissions Factor	High Emissions Factor	Primary Energy Factor
Finished Motor Gasoline	46.46%	0.00	106 tons CO ₂ e / TJ Fuel Combusted	106 tons CO ₂ e / TJ Fuel Combusted	106 tons CO ₂ e / TJ Fuel Combusted	1.187
Distillate Fuel Oil	17.92%	0.50	105 tons CO ₂ e / TJ Fuel Combusted	105 tons CO ₂ e / TJ Fuel Combusted	105 tons CO ₂ e / TJ Fuel Combusted	1.158
Kerosene	7.51%	0.00	96 tons CO ₂ e / TJ Fuel Combusted	102 tons CO ₂ e / TJ Fuel Combusted	110 tons CO ₂ e / TJ Fuel Combusted	1.205
Liquefied Petroleum Gases	12.75%	0.59	102 tons CO ₂ e / TJ Fuel Combusted	102 tons CO ₂ e / TJ Fuel Combusted	102 tons CO ₂ e / TJ Fuel Combusted	1.151
Petroleum Coke	1.87%	0.30	156 tons CO ₂ e / TJ Fuel Combusted	167 tons CO ₂ e / TJ Fuel Combusted	176 tons CO ₂ e / TJ Fuel Combusted	1.048
Still Gas	3.72%	0.59	93 tons CO ₂ e / TJ Fuel Combusted	101 tons CO ₂ e / TJ Fuel Combusted	110 tons CO ₂ e / TJ Fuel Combusted	1.092
Residual Fuel Oil	1.70%	0.00	105 tons CO ₂ e / TJ Fuel Combusted	146 tons CO ₂ e / TJ Fuel Combusted	121 tons CO ₂ e / TJ Fuel Combusted	1.191
Asphalt*	1.71%	1.00		--		--
Other Oils*	0.56%	1.00		--		--
Lubricants*	0.64%	1.00		--		--
Other*	5.16%	1.00		--		--

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End Notes

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- ²⁰ EIA 2014e.
- ²¹ Brandt, A. 2011. Upstream greenhouse gas (GHG) emissions from Canadian oil sands as a feedstock for European refineries. Report, January 18, 2011.
- ²² Deru and Torcellini’s 2007 technical paper Source Energy and Emission Factors for Energy Use in Buildings.
- ²³ EIA 2015b.
- ²⁴ EIA 2015b.
- ²⁵ EIA 2014e.
- ²⁶ Deru and Torcellini, 2007.
- ²⁷ Deru and Torcellini, 2007.
- ²⁸ Herweyer and Gupta, 2008.
- ²⁹ This is the average of Jacobs 2009, TIAX 2009, and NETL 2008.
- ³⁰ Burnham, et al. 2012.
- ³¹ This is the average of Jacobs 2009, TIAX 2009, and NETL 2008, 2009.
- ³² NETL 2008, 2009
- ³³ NETL 2008, 2009
- ³⁴ NETL 2008, 2009.
- ³⁵ EIA, 2014a.
- ³⁶ Burnham et al., 2012.
- ³⁷ EPA, 2015.
- ³⁸ Johnson, 2010.

From: Michael Saul
To: bcribley@blm.gov
Subject: Comments on 2016 National Petroleum Reserve in Alaska Oil and Gas Lease Sale
Date: Monday, May 2, 2016 6:31:46 PM
Attachments: [Center FOE NPRA nomination comment 5-2-16.pdf](#)
[Attachment A Wolf 2015 Alaskan climate change summary.pdf](#)
[Attachment B.pdf](#)
[Attachment C.pdf](#)

Dear Director Cribley,

Please find attached the comments, with three attachments, of the Center for Biological Diversity and Friends of the Earth on BLM's Call for Nominations and Comments for the 2016 National Petroleum Reserve in Alaska Oil and Gas Lease Sale.

Please do not hesitate to call or email if you have questions regarding these comments.

Sincerely,

Michael Saul

Senior Attorney, Public Lands

Center for Biological Diversity

Denver, CO

phone/text 303-915-8308

msaul@biologicaldiversity.org

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April 29, 2016

Via email: bcribley@blm.gov, wsvejnoh@blm.gov

Bud Cribley, State Director
BLM-Alaska State Office
222 West 7th Ave., #13
Anchorage, AK, 99513

Re: Call for Nominations and Comments for the 2016 National Petroleum Reserve-Alaska Oil and Gas Lease Sale (62 Fed. Reg. 18,643 (Mar. 31, 2016))

Dear Director Cribley:

Thank you for the opportunity to submit comments on tracts for 2016 leasing within the National Petroleum Reserve in Alaska (Reserve). These comments are submitted on behalf of the Center for Biological Diversity and Friends of the Earth in Alaska and throughout the United States.

The Center is a non-profit environmental organization with over one million members and supporters, including members who live near and recreate in Alaska. The Center uses science, policy and law to advocate for the conservation and recovery of species on the brink of extinction and the habitats they need to survive.

Friends of the Earth is a 501(c)(3) organization with over 33,000 members and 496,000 activists nationwide, including 1,273 who live in Alaska. FoE's mission is to protect our natural environment, including air, water and land, to create a more healthy and just world."

The Center and Friends of the Earth submit that BLM should not offer any leases for sale in 2016. In recognition of the urgent need to address the threat of climate change and the role of fossil fuel extraction and combustion, BLM should refrain from issuing any new leases within the Reserve. Documented impacts and science-based predictions of climate change in the Arctic region include sea level rise, temperature increase and fluctuation, loss of sea ice, changes in ocean circulation patterns, ocean acidification, increased tundra fires, changes in vegetation type and cover and coastal erosion, among others. These changes, combined with oil and gas development, threaten to destroy the unique and special ecological communities of the Reserve.¹

¹ For a detailed description of the impacts to the Reserve from oil and gas development and climate change, please see the Center's June 15, 2012, Comment Letter on the National Petroleum Reserve-Alaska Integrated Activity Plan and Environmental Impact Statement, and references cited therein, which is attached here as Attachment B and incorporated by reference. In addition to the references cited in the June 2012 letter, the Center submits for the

On December 12, 2015, nearly 200 governments, including the United States, agreed to the commitments enumerated in the Paris Agreement to “strengthen the global response to the threat of climate change”² The Paris Agreement codified the international consensus that the climate crisis is an urgent threat to human societies and the planet, with the parties recognizing that:

Climate change represents an *urgent and potentially irreversible threat to human societies and the planet* and thus requires the widest possible cooperation by all countries, and their participation in an effective and appropriate international response, with a view to accelerating the reduction of global greenhouse gas emissions (emphasis added).³

Numerous authoritative scientific assessments have established that climate change is causing grave harms to human society and natural systems, and these threats are becoming increasingly dangerous. The Intergovernmental Panel on Climate Change, in its 2014 Fifth Assessment Report, stated that: “[w]arming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased” and that “[r]ecent climate changes have had widespread impacts on human and natural systems.”⁴

The United States’ 2014 Third National Climate Assessment, prepared by a panel of non-governmental experts and reviewed by the National Academy of Sciences and multiple federal agencies similarly stated “[t]hat the planet has warmed is ‘unequivocal,’ and is corroborated through multiple lines of evidence, as is the conclusion that the causes are very likely human in origin”⁵ and “[i]mpacts related to climate change are already evident in many regions and are expected to become increasingly disruptive across the nation throughout this century and beyond.”⁶ The United States National Research Council similarly concluded that: “[c]limate change is occurring, is caused largely by human activities, and poses significant risks for—and in

record, as Attachment A, a summary and list of recent papers relevant to climate change impacts in the Reserve that the BLM must consider.

² United Nations Framework Convention on Climate Change, Conference of the Parties Nov. 30-Dec. 11, 2015, Adoption of the Paris Agreement Art. 2, U.N. Doc. FCCC/CP/2015/L.9 (Dec. 12, 2015), available at <http://unfccc.int/resource/docs/2015/cop21/eng/109.pdf> (“Paris Agreement”).

³ Paris Agreement, Decision, Recitals.

⁴ IPCC AR5 Synthesis Report at 2.

⁵ Melillo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, Eds., 2014: Climate Change Impacts in the United States: The Third National Climate Assessment (U.S. Global Change Research Program). doi:10.7930/J0Z31WJ2 (Third National Climate Assessment) at 61 (quoting IPCC, 2007: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, S. Solomon, D. Qin, M. Manning, Z. Chen, M. Marquis, K. B. Averyt, M. Tignor, and H. L. Miller, Eds., Cambridge University Press, 1-18.).

⁶Third National Climate Assessment at 10.

many cases is already affecting—a broad range of human and natural systems.”⁷

The IPCC and National Climate Assessment further decisively recognize the dominant role of fossil fuels in driving climate change:

While scientists continue to refine projections of the future, observations unequivocally show that climate is changing and that the warming of the past 50 years is primarily due to human-induced emissions of heat-trapping gases. These emissions come mainly from burning coal, oil, and gas, with additional contributions from forest clearing and some agricultural practices.⁸

CO₂ emissions from fossil fuel combustion and industrial processes contributed about 78% to the total GHG emission increase between 1970 and 2010, with a contribution of similar percentage over the 2000–2010 period (*high confidence*).⁹

These impacts of fossil fuels are harming the United States in myriad ways, with the impacts certain to worsen over the coming decades absent deep reductions in domestic and global GHG emissions. EPA recognized these threats in its 2009 Final Endangerment Finding under Clean Air Act Section 202(a), concluding that greenhouse gases endanger public health and welfare: “the body of scientific evidence compellingly supports [the] finding” that “greenhouse gases in the atmosphere may reasonably be anticipated both to endanger public health and to endanger public welfare.”¹⁰

As acknowledged by the BLM in Appendix C to the 2012 Reserve Integrated Activity Plan Final Environmental Impact Statement, climate change impacts are already having disproportionate effects in Alaska, and will continue to have increasingly severe impacts on average temperatures, melting of sea ice, thawing permafrost, and acidifying oceans.

Climate changes impacts in Alaska are “already pronounced,” as summarized by the 2014 National Climate Assessment, including greater-than-average warming, rapid melting of sea ice, widespread glacier retreat, thawing permafrost, and rapid ocean acidification (Melillo et al. 2014).

Alaska has warmed more than twice as rapidly as the rest of the United States over the past 60 years (Melillo et al. 2014). During this period, average annual temperatures in Alaska increased by 3°F, with 6°F of warming in winter (Melillo et al. 2014). Absent significant reductions in greenhouse gas emissions, Alaska is expected to warm by an additional 10°F to 12°F in the north, 8°F to 10°F in the interior, and 6°F to 8°F in the rest of the state by the end of the century (Melillo et al. 2014).

⁷ National Research Council, *Advancing the Science of Climate Change* (2010), available at www.nap.edu. (“*Advancing the Science of Climate Change*”) at 2.

⁸ Third National Climate Assessment at 2.

⁹ IPCC AR5 Synthesis Report at 46.

¹⁰ Final Endangerment Finding, 74 Fed. Reg. at 66,497.

One of the most disruptive consequences of climate change is the rapid melting of Arctic sea ice. Arctic summer sea ice is receding faster than climate models have predicted and is expected to virtually disappear before mid-century (Melillo et al. 2014). Summer sea ice extent and thickness have decreased by half over the past few decades (Stroeve et al. 2008, Kwok and Rothrock 2009, Melillo et al. 2014), with an accompanying drastic reduction in volume (Schweiger et al. 2012). The length of the sea ice season is shortening, as ice melts earlier in spring and forms later in autumn (Parkinson 2014). Sea-ice losses have been particularly large in the Chukchi and Beaufort Seas (Meier et al. 2007, Parkinson and Cavalieri 2008). In the Chukchi and Beaufort Seas, sea-ice thickness declined by -64% and -50%, respectively, between 1958 to 2007 (Kwok and Rothrock 2009), and the length of the ice season decreased by 35 days between 1979 and 2007 (Markus et al. 2009).

Arctic summer sea ice is expected to virtually disappear before mid-century, with estimates of 2020 or earlier, 2030 on average, and 2040 or later based on three modeling approaches (Overland and Wang 2013). Winter sea ice is also declining faster than IPCC climate models have projected (Stroeve et al. 2007). In the Bering Sea, winter (March and April) sea-ice cover is expected to decline by ~43% by 2050 under a mid-range A1B emissions scenario (Wang et al. 2010). The rapid loss of Arctic sea ice is disrupting ecosystems, leading to greater access for shipping and offshore development, and increasing vulnerability to coastal erosion (Melillo et al. 2014).

Alaska houses some of the world's largest glaciers and is experiencing among the fastest losses of glacial ice on the planet, which has been attributed to rising temperatures from global warming (Melillo et al. 2014). More than 98% of Alaska's glaciers are retreating and/or thinning, leading to massive ice loss (Molnia 2007), and the rate of Alaskan glacier retreat and thinning has accelerated in recent decades (Arendt et al. 2002, Dyurgerov and McCabe 2006). The global decline in glacial ice loss is predicted to be one of the largest contributors to global sea level rise during this century (Melillo et al. 2014).

Permafrost underlies 80% of the land surface in Alaska, and permafrost thaw is already underway in interior and southern Alaska where permafrost temperatures are near the thaw point (Melillo et al. 2014). In northern Alaska, permafrost temperature has increased by up to 2 to 3°C since the 1980s, including areas of the coastal Arctic National Wildlife Refuge (Jorgenson et al. 2006, Osterkamp and Jorgenson 2006). Models project that permafrost in Alaska will continue to thaw, and that near-surface permafrost may be entirely lost from large parts of Alaska by the end of the century (Melillo et al. 2014). As permafrost thaws, it releases carbon dioxide and the powerful greenhouse gas methane into the atmosphere, which contribute to further warming in a reinforcing feedback loop (Koven et al. 2011, Schaefer et al. 2011). Permafrost plays an essential role in the Alaskan ecosystem by making the ground watertight and maintaining the vast network of wetlands and lakes across the tundra that provide habitat for animals and plants.

Alaskan shorelines are eroding at an accelerating rate due to the combined effects of sea-ice loss, increasing sea surface temperatures, increasing terrestrial permafrost degradation, rising sea levels, and increases in storm power and corresponding wave action (Jones et al. 2009). In Alaska, coastal erosion rates have doubled in the past 50 years along the Beaufort Sea shoreline

(Lantuit and Pollard 2008, Mars and Houseknecht 2008, Jones et al. 2009). Increasing coastal erosion jeopardizes species that use coastal habitats for breeding, such as the polar bear, which uses coasts and barrier islands for denning (Durner et al. 2006).

Sea level rise in many regions of the Arctic is advancing much faster than the global average, with particularly rapid increases in sea level occurring in recent years. Global average sea level rose by roughly eight inches (19 centimeters) over the past century, and sea level rise is accelerating in pace (IPCC 2013, Melillo et al. 2014). Recent studies indicate that a global mean sea level rise of 3 to 4 feet is likely within this century, and 6.6 feet is possible, with estimates as follows: 0.5 to 1.4 m (Rahmstorf 2007), 0.75 m to 1.90 m (Vermeer and Rahmstorf 2009), 0.8 m to 2.0 m (Pfeffer et al. 2008), 0.8 m to 1.3 m (Grinsted et al. 2010), and 0.6 m to 1.6 m (Jevrejeva et al. 2010). In its 2012 sea-level rise assessment, the National Research Council estimated global sea level rise at 8 to 23 cm by 2030, 18 to 48 cm by 2050, and 0.5 m to 1.4 m by 2100 (NRC 2012). The 2014 National Climate Assessment reported that sea level is projected to rise by 1 to 4 feet in this century, with the possibility of 6.6 feet of rise (Melillo et al. 2014).

The waters off Alaska are particularly vulnerable to ocean acidification (Fabry et al. 2009, Feely et al. 2009, Mathis et al. 2015). Seasonal aragonite undersaturation is already occurring in the Bering, Chukchi, and Beaufort Seas (Bates et al. 2009, Fabry et al. 2009, Yamamoto-Kawai et al. 2009). Mean surface pH values in the Gulf of Alaska, Bering, Chukchi and Beaufort Seas have decreased by 0.1 to 0.14 pH units since pre-industrial times, equivalent to a more 30% increase in acidity, with future surface pH projected to decrease by another 0.34 to 0.37 pH units by the end of the century (Mathis et al. 2015: Table 2). If current emissions trends continue, by 2050 all Arctic surface waters are expected to be corrosive to organisms that use aragonite to build their shells, and that most of the Arctic, including regions of the Bering and Chukchi Seas, will be corrosive to calcite-using organisms by 2095 (Fabry et al. 2009, Feely et al. 2009).

In light of the Paris Agreement, the President's stated climate goals, and the significant new information available since the 2012 IAP/FEIS, including the Third National Climate Assessment and the International Panel on Climate Change's (IPCC's) Fifth Assessment Report, there is an overwhelming need to cease new leasing of federal fossil fuels until comprehensive policies can be developed and actions taken to mitigate greenhouse gas emissions and put the nation and world on a path to keeping warming under 1.5°C.

Immediate and aggressive greenhouse gas emissions reductions are necessary to limit global warming to a 1.5°C rise above pre-industrial levels. Put simply, there is only a finite amount of CO₂ that can be released into the atmosphere without rendering the goal of meeting the 1.5°C (or even a 2°C) target virtually impossible. Globally, proven fossil fuel reserves, let alone additional recoverable resources,¹¹ if extracted and burned, would release enough CO₂ to

¹¹ According to the Congressional Research Service, “[p]roved reserves are those amounts of oil, natural gas, or coal that have been discovered and defined at a significant level of certainty, typically by drilling wells or other exploratory measures, and which can be economically recovered. In the United States, proved reserves are typically measured by private companies, who report their findings to the Securities and Exchange Commission because those reserves are considered capital assets. Because proved reserves are defined by strict rules, they do not include all of the oil or gas in a region, but only those amounts that have been carefully confirmed. . . . Undiscovered resources are

exceed this limit several times over.¹² Consequently, the vast majority of fossil fuels must remain in the ground. The physical question of what amount of fossil fuels can be extracted and burned without negating a realistic chance of meeting a 1.5°C or even 2°C target is relatively easy to answer. The Fifth Assessment Report of the IPCC and other expert assessments have established global carbon budgets, or the total amount of remaining carbon that can be burned while maintaining some probability of staying below a given temperature target. According to the IPCC, total cumulative anthropogenic emissions of CO₂ must remain below about 1,000 gigatonnes (GtCO₂) from 2011 onward for a 66% probability of limiting warming to 2°C above pre-industrial levels.¹³ The Paris Agreement aim of limiting the temperature increase to 1.5°C requires a more stringent carbon budget of only 400 GtCO₂ from 2011 onward (of which more than 100 GtCO₂ has already been emitted)¹⁴ for a 66% probability of limiting warming to 1.5°C above pre-industrial levels.¹⁵ Increasing the odds of meeting these targets requires meeting even stricter carbon budgets.¹⁶ Given that global CO₂ emissions in 2014 alone totaled 36 GtCO₂,¹⁷ humanity is rapidly consuming the remaining burnable carbon budget needed to have even a 66% chance of meeting the 1.5°C temperature limit.

For the world to stay within a carbon budget consistent with a 1.5°C temperature limit, significant fossil fuels around the world need to be left in the ground. The United States alone contains enough recoverable fossil fuels, split about evenly between federal and non-federal resources, that if extracted and burned, would approach the entire global carbon budget for a 2°C

amounts of oil and gas estimated to exist in unexplored areas. Estimates of undiscovered resources for the United States are made by the U.S. Geological Survey for resources on land, and by the Bureau of Ocean Energy Management Regulation and Enforcement (formerly the Minerals Management Service) [now simply the Bureau of Ocean Energy Management] for resources offshore. These assessments are based on observation of geological characteristics similar to producing areas and many other factors. Reported statistics for undiscovered resources may vary greatly in precision and accuracy (determined retrospectively), which are directly dependent upon data availability, and their quality may differ for different fuels and different regions.” Whitney, Gene *et al.*, Cong. Research Serv., R40872, U.S. Fossil Fuel Resources: Terminology, Reporting and Summary 4-5 (2010).

¹² See, e.g., IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change at 64 & Table 2.2 [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)] at 63-64 & Table 2.2. (“IPCC AR5 Synthesis Report”); Marlene Cimos, Keep It In the Ground 6 (Sierra Club *et al.*, Jan. 25, 2016).

¹³ IPCC, 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change; Summary for Policymakers at 27 (“IPCC AR5 Physical Science Basis”). See also IPCC AR5 Synthesis Report at 63-64 & Table 2.2. Higher probabilities of success require stricter carbon limits; to have an 80% probability of staying below the 2°C target, the budget from 2000 is 890 GtCO₂, with less than 430 GtCO₂ remaining. See Meinshausen, M. *et al.*, Greenhouse gas emission targets for limiting global warming to 2 degrees Celsius, 458 Nature 1158–1162 (2009) (“Meinshausen *et al.* 2009”) at 1159; Carbon Tracker Initiative, Unburnable Carbon – Are the world’s financial markets carrying a carbon bubble? available at <http://www.carbontracker.org/wp-content/uploads/2014/09/Unburnable-Carbon-Full-rev2-1.pdf>.

¹⁴ From 2012-2014, 107 GtCO₂ was emitted (see Annual Global Carbon Emissions at <http://co2now.org/Current-CO2/CO2-Now/global-carbon-emissions.html>). Given additional emissions in 2015, the remaining carbon budget for 1.5°C would now be well below 300 GtCO₂ (approximately 450 Gt CO₂e)

¹⁵ IPCC AR5 Synthesis Report at 64 & Table 2.2.

¹⁶ See Meinshausen *et al.* at 1159; Carbon Tracker Initiative 2013, Unburnable Carbon.

¹⁷ See Global Carbon Emissions, <http://co2now.org/Current-CO2/CO2-Now/global-carbon-emissions.html>.

target, and exceed the remaining budget for a 1.5°C limit.¹⁸ Clearly, even if the rest of the world somehow reduced its carbon emissions to near zero, the United States still could not safely burn all of its own fossil fuel resources. The majority of United States fossil fuels simply must be kept in the ground.

Unleased federal fossil fuels, if extracted and burned, would consume between roughly 70 and 100% of a *global* budget of 450 GtCO₂e, the amount remaining at the start of 2016 under a budget scenario that itself has only a 66% chance of limiting temperature increase to 1.5°C.¹⁹ Under a more cautionary budget (i.e., one with a higher probability of success), unleased federal fossil fuels alone could exceed the entire global budget. Continued leasing of these fossil fuels, without examining the climate consequences of such action, is incompatible with any reasonable domestic and international path to limiting warming to 1.5°C or even 2°C.

Two recent studies estimated that global oil, gas, and coal resources considered currently economically recoverable contain potential greenhouse gas emissions estimated at 2,900 GtCO₂²⁰ and 4196 GtCO₂²¹ respectively. Other sources estimate even greater global fossil fuel reserves at 3,677 to 7,120 GtCO₂.²² When considering all fossil fuel resources (defined as those recoverable over all time with both current and future technology irrespective of current economic conditions), potential combustion emissions have been estimated at nearly 11,000 GtCO₂²³ upwards to 31,353 and 50,092 GtCO₂.²⁴

Even the lowest of these estimates (2,900 GtCO₂) is more than three times greater than the most generous carbon budget nominally consistent with a 2°C temperature limit (~900 GtCO₂), while the largest (50,092 GtCO₂) is over 160 times greater than the remaining budget for a 66% probability of not exceeding a 1.5°C limit (<300 GtCO₂).

As stated by one study, “the disparity between what resources and reserves exist and

¹⁸ See Mulvaney, Dustin *et al.*, The Potential Greenhouse Gas Emissions of U.S. Federal Fossil Fuels 4 (EcoShift Consulting 2015) (Attachment C).

¹⁹ *Id.* The emission potential of unleased federal fossil fuels are estimated at 319-450 GtCO₂e. The global carbon budget at the start of 2015 for a 66% chance of limiting temperature increase to 1.5°C was approximately 300 GtCO₂ which is equivalent to ~450 GtCO₂e, meaning that the potential emissions of unleased federal fossil fuels would consume 70 to 100% of this global budget. There is no single universally applicable factor for converting between CO₂ and CO₂e because the ultimate radiative forcing potential of fossil fuel extraction and combustion depends on a number of assumptions regarding the production and use of those fuels. In this Petition we use a conversion factor of 1 GtCO₂ = 1.5 GtCO₂e based on Table 1 in Meinshausen *et al.* 2009.

²⁰ McGlade and Ekins at 187-192.

²¹ Raupach, M. *et al.*, Sharing a quota on cumulative carbon emissions. 4 Nature Climate Change 873-879 (2014) at Figure 2.

²² IPCC, 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change at Table 7.2 [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. (“IPCC AR5 Mitigation of Climate Change”)

²³ McGlade and Ekins at 188.

²⁴ IPCC AR5 Mitigation of Climate Change at Table 7.2.

what can be emitted while avoiding a temperature rise greater than the agreed 2C limit is therefore stark.”²⁵ Another recent report on global carbon reserves found that:

The reserves of coal, oil and natural gas outlined in this report contain enough carbon to rocket the planet far beyond the 2 °C limit. Warming from fossil fuels puts other carbon sinks at risk. As permafrost melts and peat bogs dry, they emit enormous quantities of carbon dioxide, furthering a chain reaction where the release of carbon results in a warmer world, which in turn releases more carbon.²⁶

Under *any* formulation, the vast majority of United States fossil fuels, must stay in the ground if we are to have any realistic hope of staying below 1.5°C, or even 2°C of warming. A recent detailed analysis found that the United States alone contains enough recoverable fossil fuels, split about evenly between federal and non-federal resources, which if extracted and burned, would generate enough greenhouse emissions (median estimate 840 GtCO₂e) to consume more than half the entire global carbon budget for a 2°C target (~900 GtCO₂, equivalent to ~1350 GtCO₂e), and greatly exceed the remaining budget for a 1.5°C target (~300 GtCO₂ equivalent to ~450 GtCO₂e).²⁷ Clearly, even if the rest of the world somehow reduced its carbon emissions to near zero, the United States still could not safely burn all of its own fossil fuels.

This analysis highlights the impossibility of reconciling continued leasing of federal fossil fuels with a pathway to keeping warming from exceeding 1.5°C. Total remaining fossil fuel resources in the United States, including both federal and non-federal resources, are estimated to equate to 697 to 1070 GtCO₂e of emissions.²⁸ Federal fossil fuels represent about half (46-50%) of that total at between 349 and 492 GtCO₂e of potential emissions,²⁹ and the vast majority (91%) of federal fossil fuels are still unleased.³⁰ Overall the potential greenhouse gas emissions of unleased federal fossil fuel resources are enormous, estimated at 319 to 450 GtCO₂e. In other words, unleased federal fossil fuels, if extracted and burned, would consume between 70 and 100% of a *global* budget of 300 GtCO₂ (equivalent to ~450 GtCO₂e), the amount remaining at the start of 2015 under a budget scenario that itself has only a 66% chance of limiting temperature increase to 1.5°C.

As described above, United States resources greatly exceed the *entire* global budget for a

²⁵ McGlade and Ekins at 188.

²⁶ Cimos at 6.

²⁷ See Mulvaney *et al.* at 4. Using a metric of CO₂e (which also includes conservative estimates for the radiative forcing potential of non-CO₂ greenhouse gases such as methane, compare Mulvaney *et al.* at Table A12 with IPCC AR5 Physical Science Basis at 714 & Table 8.7), this study calculated that extraction and combustion of total U.S. recoverable fossil fuels would produce 697 to 1070 GtCO₂e of emissions, with a median estimate of 840 GtCO₂e. To compare these emissions to the global carbon budgets for 1.5°C and 2°C, we converted these carbon budgets from to GtCO₂ to GtCO₂e by applying a conversion factor of 1 GtCO₂ = 1.5 GtCO₂e based on Table 1 in Meinshausen *et al.* 2009.

²⁸ Mulvaney *et al.* 19 Table 2.

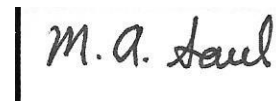
²⁹ *Id.* at 18.

³⁰ *Id.*

66% chance of limiting warming to 1.5°C. Emissions from use of the median estimate of non-federal fossil fuels (435 GtCO₂e) themselves would use up almost the entire global budget, while unleased fossil fuels alone (370 GtCO₂e) would utilize over 80% of that budget. Even under a carbon budget in which great risk to human health, prosperity, and stability and the planet's natural systems is tolerated (only 50% chance of staying below 2°C) the United States still cannot utilize the entirety of its non-federal fossil fuel resources, much less those under direct federal control.

For these reasons, BLM should refrain from issuing any new leases within the Reserve. As set forth above and in Attachments A and B, documented impacts and science-based predictions of climate change in the Arctic region include sea level rise, temperature increase and fluctuation, loss of sea ice, changes in ocean circulation patterns, ocean acidification, increased tundra fires, changes in vegetation type and cover and coastal erosion, among others. These changes, combined with oil and gas development, threaten to destroy the unique and special ecological communities of the Reserve. In order to ensure adequate protection of the unique and sensitive resources it is entrusted with conserving, BLM should not hold a 2016 lease sale for the Reserve, and should refrain from issuing any new leases until such time as it can ensure that federal fossil fuel policy leasing is consistent with national climate goals and a path to limiting warming to 1.5°C.

Respectfully submitted this 2nd day of May, 2016,



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Alaska climate change summary

Climate changes impacts in Alaska are “already pronounced,” as summarized by the 2014 National Climate Assessment, including greater-than-average warming, rapid melting of sea ice, widespread glacier retreat, thawing permafrost, and rapid ocean acidification (Melillo et al. 2014).

Alaska has warmed more than twice as rapidly as the rest of the United States over the past 60 years (Melillo et al. 2014). During this period, average annual temperatures in Alaska increased by 3°F, with 6°F of warming in winter (Melillo et al. 2014). Absent significant reductions in greenhouse gas emissions, Alaska is expected to warm by an additional 10°F to 12°F in the north, 8°F to 10°F in the interior, and 6°F to 8°F in the rest of the state by the end of the century (Melillo et al. 2014).

One of the most disruptive consequences of climate change is the rapid melting of Arctic sea ice. Arctic summer sea ice is receding faster than climate models have predicted and is expected to virtually disappear before mid-century (Melillo et al. 2014). Summer sea ice extent and thickness have decreased by half over the past few decades (Stroeve et al. 2008, Kwok and Rothrock 2009, Melillo et al. 2014), with an accompanying drastic reduction in volume (Schweiger et al. 2012). The length of the sea ice season is shortening, as ice melts earlier in spring and forms later in autumn (Parkinson 2014). Sea-ice losses have been particularly large in the Chukchi and Beaufort Seas (Meier et al. 2007, Parkinson and Cavalieri 2008). In the Chukchi and Beaufort Seas, sea-ice thickness declined by -64% and -50%, respectively, between 1958 to 2007 (Kwok and Rothrock 2009), and the length of the ice season decreased by 35 days between 1979 and 2007 (Markus et al. 2009).

Arctic summer sea ice is expected to virtually disappear before mid-century, with estimates of 2020 or earlier, 2030 on average, and 2040 or later based on three modeling approaches (Overland and Wang 2013). Winter sea ice is also declining faster than IPCC climate models have projected (Stroeve et al. 2007). In the Bering Sea, winter (March and April) sea-ice cover is expected to decline by ~43% by 2050 under a mid-range A1B emissions scenario (Wang et al. 2010). The rapid loss of Arctic sea ice is disrupting ecosystems, leading to greater access for shipping and offshore development, and increasing vulnerability to coastal erosion (Melillo et al. 2014).

Alaska houses some of the world’s largest glaciers and is experiencing among the fastest losses of glacial ice on the planet, which has been attributed to rising temperatures from global warming (Melillo et al. 2014). More than 98% of Alaska’s glaciers are retreating and/or thinning, leading to massive ice loss (Molnia 2007), and the rate of Alaskan glacier retreat and thinning has accelerated in recent decades (Arendt et al. 2002, Dyurgerov and McCabe 2006). The global decline in glacial ice loss is predicted to be one of the largest contributors to global sea level rise during this century (Melillo et al. 2014).

Permafrost underlies 80% of the land surface in Alaska, and permafrost thaw is already underway in interior and southern Alaska where permafrost temperatures are near the thaw point (Melillo et al. 2014). In northern Alaska, permafrost temperature has increased by up to 2 to 3°C

since the 1980s, including areas of the coastal Arctic National Wildlife Refuge (Jorgenson et al. 2006, Osterkamp and Jorgenson 2006). Models project that permafrost in Alaska will continue to thaw, and that near-surface permafrost may be entirely lost from large parts of Alaska by the end of the century (Melillo et al. 2014). As permafrost thaws, it releases carbon dioxide and the powerful greenhouse gas methane into the atmosphere, which contribute to further warming in a reinforcing feedback loop (Koven et al. 2011, Schaefer et al. 2011). Permafrost plays an essential role in the Alaskan ecosystem by making the ground watertight and maintaining the vast network of wetlands and lakes across the tundra that provide habitat for animals and plants.

Alaskan shorelines are eroding at an accelerating rate due to the combined effects of sea-ice loss, increasing sea surface temperatures, increasing terrestrial permafrost degradation, rising sea levels, and increases in storm power and corresponding wave action (Jones et al. 2009). In Alaska, coastal erosion rates have doubled in the past 50 years along the Beaufort Sea shoreline (Lantuit and Pollard 2008, Mars and Houseknecht 2008, Jones et al. 2009). Increasing coastal erosion jeopardizes species that use coastal habitats for breeding, such as the polar bear, which uses coasts and barrier islands for denning (Durner et al. 2006).

Sea level rise in many regions of the Arctic is advancing much faster than the global average, with particularly rapid increases in sea level occurring in recent years. Global average sea level rose by roughly eight inches (19 centimeters) over the past century, and sea level rise is accelerating in pace (IPCC 2013, Melillo et al. 2014). Recent studies indicate that a global mean sea level rise of 3 to 4 feet is likely within this century, and 6.6 feet is possible, with estimates as follows: 0.5 to 1.4 m (Rahmstorf 2007), 0.75 m to 1.90 m (Vermeer and Rahmstorf 2009), 0.8 m to 2.0 m (Pfeffer et al. 2008), 0.8 m to 1.3 m (Grinsted et al. 2010), and 0.6 m to 1.6 m (Jevrejeva et al. 2010). In its 2012 sea-level rise assessment, the National Research Council estimated global sea level rise at 8 to 23 cm by 2030, 18 to 48 cm by 2050, and 0.5 m to 1.4 m by 2100 (NRC 2012). The 2014 National Climate Assessment reported that sea level is projected to rise by 1 to 4 feet in this century, with the possibility of 6.6 feet of rise (Melillo et al. 2014).

The waters off Alaska are particularly vulnerable to ocean acidification (Fabry et al. 2009, Feely et al. 2009, Mathis et al. 2015). Seasonal aragonite undersaturation is already occurring in the Bering, Chukchi, and Beaufort Seas (Bates et al. 2009, Fabry et al. 2009, Yamamoto-Kawai et al. 2009). Mean surface pH values in the Gulf of Alaska, Bering, Chukchi and Beaufort Seas have decreased by 0.1 to 0.14 pH units since pre-industrial times, equivalent to a more 30% increase in acidity, with future surface pH projected to decrease by another 0.34 to 0.37 pH units by the end of the century (Mathis et al. 2015: Table 2). If current emissions trends continue, by 2050 all Arctic surface waters are expected to be corrosive to organisms that use aragonite to build their shells, and that most of the Arctic, including regions of the Bering and Chukchi Seas, will be corrosive to calcite-using organisms by 2095 (Fabry et al. 2009, Feely et al. 2009).

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Attachment B:

**Center for Biological Diversity Comment Letter on the
National Petroleum Reserve-Alaska Integrated Activity Plan
and Environmental Impact Statement, June 15, 2012**



SUBMITTED VIA HAND DELIVERY

June 15, 2012

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Re: NPR-A Draft IAP/EIS Comments

Thank you for the opportunity to comment on the Bureau of Land Management's (BLM) Draft Environmental Impact Statement (DEIS) regarding the National Petroleum Reserve Alaska (NPR-A). These comments are submitted on behalf of the Center for Biological Diversity (the Center).

The four alternatives currently included in the DEIS all would have substantial impacts to this vast and relatively pristine wilderness area, with a minimum of 50 percent of the NPR-A offered for lease sales for oil and gas development under the most environmentally protective Alternative B. Connected actions associated with commercial oil and gas development in the NPR-A include a gas pipeline to Anchorage, Alaska, another gas pipeline to Canada, the infrastructure associated with oil and gas development within the NPR-A, and a future pipeline through the NPR-A from offshore oil and gas development in the Chukchi Sea. The significant environmental impacts from offshore oil and gas development would be enabled in large part through infrastructure and pipelines on the NPR-A, and the DEIS makes it clear that this infrastructure is part of the purpose of lease sales under any alternative. Thus, offshore development is largely contingent on lease sales in the NPR-A.

The Center does not support lease sales anywhere in the NPR-A. Any development threatens to destroy the wilderness and roadless characteristics of this vast and ecologically critical area, and would allow for further ecological damage and significant amounts of greenhouse gas emissions through commercial development of oil and gas in the NPR-A and from offshore oil and gas development. Climate change impacts are a huge threat to the ecological communities of the NPR-A and the Arctic. Documented impacts and science-based predictions of climate change in the Arctic region include sea level rise, temperature increase and fluctuation, loss of sea ice, changes in ocean circulation patterns, ocean acidification, increased tundra fires, changes in vegetation type and cover, and coastal erosion, among others. The FEIS must consider the

impacts of oil and gas development in the context of climate change, both in terms of the greenhouse gas emissions produced under each alternative, and cumulative impacts of habitat degradation and direct disturbance resulting from oil and gas activities.

Due to the profoundly negative effects of oil and gas development on the ecological communities of the NPR-A, the FEIS should include an environmentally protective alternative that allows for no lease sales as the no-action alternative. In the event the BLM proceeds with lease sales in the NPR-A, we urge the BLM to select a modified Alternative B as the preferred Alternative. A modified Alternative B (Alternative B+) must replace the nonbinding measures currently included in the DEIS Special Area designations with clear and legally binding language permanently protecting significant wildlife and habitat areas from oil and gas development. These protected areas must include all of the Special Areas and environmentally protective measures in the DEIS's Alternative B and should permanently protect additional ecologically important areas in order to maintain the wilderness characteristics of the NPR-A and to provide undisturbed habitat for wildlife as sea level rise, changes in vegetation type and seasonality, and other ecological changes greatly reduce quantity and quality of inland and thermokarst habitat over the next century. These changes will be especially prevalent on the coastal plain. The environmental review of lease sales offered under any alternative must include an analysis of climate change impacts, alternatives to reduce greenhouse gas emissions, impacts on endangered, threatened and sensitive species, and mitigation measures to reduce all such impacts.

The alternative analysis in the DEIS is incomplete and inadequate in considering the compounding impacts of climate change and oil and gas development on the ecological and wilderness characteristics of the NPR-A. While Chapter 3 of the DEIS (Affected Environment) discusses some of the potential impacts of climate change on specific resources, these impacts are not analyzed adequately in Chapter 4 (Environmental Consequences). For some important ecological resources, climate change is only given perfunctory mention but not considered in regards to oil and gas development (e.g., Vegetation section 4.3.5.4). Specifically, critical climate change issues including sea level rise, coastal erosion, and methane gas leakage and emissions receive no or little attention in the DEIS.

The DEIS fails to adequately disclose, analyze, and mitigate, *inter alia*, the following:

- The greenhouse gas emissions from the exploration, development, production, transportation, and combustion of the oil and gas ultimately produced as a result of the lease sales under each alternative. Such analysis must include both CO₂ and non-CO₂ emissions (e.g., methane and black carbon) and should consider the entire lifecycle of oil and gas extracted from the NPR-A. Analysis must also include greenhouse gas emissions from the offshore oil and gas enabled by infrastructure on the NPR-A, and not be limited to greenhouse gas emissions produced by combustion engines used as part of development and exploration;
- The environmental, societal, social, economic, and health, consequences of the greenhouse gas emissions and consequent warming associated with the lease sales under each alternative;
- Climate change as a cumulative impact of the lease sales;

- Ocean acidification both as a cumulative impact of the lease sales and as an environmental baseline;
- The rapidly changing Arctic as an environmental consequence of the greenhouse emissions of the lease sales;
- Impacts of sea level rise and coastal erosion as a consequence of climate change and in conjunction with oil and gas development;
- Analysis of the sensitive species and habitats affected by the lease sales, including polar bears, bowhead whales, various ice seals, walruses, and other marine mammals, seabirds, fish, invertebrates, as well as terrestrial wildlife in the context of climate change and the lease sales' cumulative impacts;
- The legal context of the lease sales, including compliance with domestic law (National Environmental Policy Act (NEPA), Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA)) and international law (United Nations Framework Convention on Climate Change);
- A range of reasonable alternatives, including a viable no-action alternative that allows for no lease sales as a baseline;
- Alternatives to the proposed action alternatives, including an alternative that is consistent with the call put out by leading climate scientists and incorporated in several legislative proposals to reduce U.S. greenhouse gas emissions by 80 percent by 2050;
- Instead of Special Areas that as described by the BLM do not “impede oil and gas development” (NPR-A DEIS 2.4.4), permanent protection for all important ecological areas, including all protected areas in Alternative B with additional measures and protected areas added that preclude any and all lease sales or oil and gas exploration or development. Permanent protections would be established by Wilderness designation, establishment of wildlife refuges, and/or legislatively protected BLM areas;
- All necessary mitigation measures to reduce the direct and indirect impacts of the proposed action.

Further details on each of these issues, as well as background information on the impacts of global warming, the need to reduce greenhouse gas emissions, and the species directly and indirectly affected by the leasing authorized under the alternatives in the DEIS follows.¹

A. *The National Environmental Policy Act*

The National Environmental Policy Act (NEPA) is the “basic national charter for protection of the environment.” 40 C.F.R. § 1500.1(a). Congress intended NEPA to “encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation.” 42 U.S.C. § 4321.

¹ We also join in and incorporate by reference the critique of the DEIS contained in the coalition comment letter submitted by the Wilderness Society and other groups to the degree such comments are consistent with these.

To accomplish these goals, all federal agencies must assess the environmental impacts of their proposals before taking any action on them. The preparation of an Environmental Impact Statement (EIS) lies at the heart of NEPA, and must “provide full and fair discussion” of impacts such as greenhouse gas emissions and global warming implications and must “inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize” these impacts. 40 C.F.R. § 1502.1.

The purpose of the NEPA review process is two-fold: “First, it places upon [the action] agency the obligation to consider every significant aspect of the environmental impact of a proposed action. Second, it ensures that the agency will inform the public that it has indeed considered environmental concerns in its decisionmaking process.” *Kern v. United States Bureau of Land Management*, 284 F.3d 1062, 1066 (9th Cir. 2002). *See also Columbia Basin Protection Ass’n v. Schlesinger*, 643 F.2d 585, 592 (9th Cir. 1981) (“[T]he preparation of an EIS ensures that other officials, Congress, and the public can evaluate the environmental consequences independently.”).

These dual objectives require that environmental information be disseminated “early enough so that it can serve practically as an important contribution to the decisionmaking and will not be used to rationalize or justify decisions already made.” 40 C.F.R. § 1502.5. *See also Marsh v. Oregon Natural Resources Council*, 490 U.S. 360, 371 (1989) (“the broad dissemination mandated by NEPA permits the public and other government agencies to react to the effects of a proposed action at a meaningful time”); *Metcalf v. Daley*, 214 F. 3d 1135, 1143-44 (9th Cir. 2000). Ultimately, an EIS satisfies NEPA only if

“its form, content, and preparation substantially (1) provide decision-makers with an environmental disclosure sufficiently detailed to aid in the substantive decision whether to proceed with the project in light of its environmental consequences, and (2) make available to the public, information of the proposed project’s environmental impacts and encourage participation in the development of that information.”

Trout Unlimited v. Morton, 509 F.2d 1276, 1283 (9th Cir. 1974). Under NEPA, BLM must fully analyze the environmental impacts of oil and gas leasing in the NPR-A, including the greenhouse gas impacts of such leasing. The DEIS, however, is grossly inadequate in this regard.

B. Climate Change and Greenhouse Gas Emissions

The DEIS’s consideration of climate change and the impact it is having on the NPR-A ecosystem is woefully inadequate. The Arctic is experiencing a cascade of related impacts from climate change that are altering the nature and function of the ecosystem. In addition to atmospheric warming, greenhouse gas emissions are leading to warmer waters, increased frequency of extreme weather events, rapidly melting sea ice, sea level rise, coastal and lakeside erosion, ocean acidification, and increased tundra fires, all of which have negative impacts on the NPR-A environment and wildlife. Without considering these changes and how they will interact with the

proposed alternatives, BLM cannot make an informed decision about the relative impacts of the various alternatives. Although BLM makes some attempt to consider the greenhouse gases that will be directly produced by construction activities in the four alternatives, it does not consider the greenhouse gases that will be produced by the burning of the oil and gas extracted from lands on the NPR-A (i.e., the lifecycle of the oil and gas), or from the release of methane from melting permafrost and the seafloor. There is also no analysis of the greenhouse gas emissions that will be released by offshore oil and gas development that would be enabled by lease sales in the NPR-A. Nor does the DEIS address how impacts from the already-changing climate will act cumulatively with the proposed alternatives to affect the NPR-A ecosystem. This section provides detailed information on the scientific basis for human-caused climate change, and the important negative impacts climate change will have on the function and processes of ecosystems within the NPR-A.

The scientific information and discussion throughout this discussion of climate change will provide ample evidence that a modified Alternative B (here described as Alternative B+) that mandates permanent protection for all of the protected areas, and additional permanent protections for other ecologically important areas is by far the best alternative for preserving ecological functions and processes within the NPR-A in the context of a rapidly warming climate. Alternative B+ will best allow vulnerable species in the NPR-A to adapt to the drastic climatic changes they face, without additional and serious disturbances from oil and gas development and exploration activities. Alternative B+ should include measures that provide for permanent protections from oil and gas development and exploration for all designated Special Areas included in Alternative B. Additional protections and mitigation measures under Alternative B+ should be included to protect wildlife resources and habitat, especially because important habitat areas, such as the Teshukpek Lake area, will be inundated by sea level rise within this century (Hansen et al. 2006, Pritchard et al. 2009), forcing birds, caribou and other species that depend on this area for critical biological needs such as feeding, calving, or nesting, to relocate to inland habitat further south if they survive at all. By not including an environmentally protective alternative, such as the above described Alternative B+, the BLM fails to adequately consider the vast scientific evidence regarding climate change impacts to the NPR-A. This violates NEPA requirements to “make available to the public, information of the proposed project’s environmental impacts and encourage participation in the development of that information.” *Trout Unlimited v. Morton*, 509 F.2d 1276, 1283 (9th Cir. 1974).

1. Greenhouse Gas Emissions and Climate Change

The global average temperature has risen by approximately $0.74^{\circ}\text{C} \pm 0.18^{\circ}\text{C}$ ($1.33^{\circ}\text{F} \pm 0.32^{\circ}\text{F}$) during the past 100 years (1906-2005) (Trenberth et al. 2007). Important advances in the detection and attribution of global warming have demonstrated, beyond any legitimate scientific debate, that a significant portion of this observed warming is due to anthropogenic greenhouse gas emissions (Barnett et al. 2005, Trenberth et al. 2007).

Past anthropogenic greenhouse gas emissions have altered the energy balance of the earth by 0.85 ± 0.15 watts per square meter (Hansen et al. 2005). Due to the lag time in the climate

system, this energy imbalance commits the earth to additional warming of 0.6° C (1° F) that is already “in the pipeline,” even absent additional greenhouse gas emissions (Hansen et al. 2005).

Because greenhouse gas emissions are continuing to increase, warming is projected to accelerate. Based on differing scenarios of future greenhouse gas emissions and the world’s leading climate models, the IPCC has projected 1.1° C to 6.4° C (2° F to 11.5° F) of additional warming by the end of this century (Solomon et al. 2007). The higher the level of greenhouse gas emissions, the more the world will warm.

As scientific understanding of global warming has advanced, so too has the urgency of the warnings from scientists about the consequences of our greenhouse gas emissions. Scientists are now able to tell us, with a high degree of certainty, that additional warming of more than 1° C (1.8° F) above year 2000 levels will constitute “dangerous climate change,” with particular reference to sea level rise and species extinction (Hansen et al. 2006, Hansen et al. 2007). Furthermore, scientists are able to tell us the atmospheric greenhouse gas level “ceiling” that must not be exceeded in order to prevent additional warming of more than 1° C (1.8° F) above year 2000 levels (Hansen et al. 2006, Hansen et al. 2007). In turn, scientists can tell us the limitations that must be placed on greenhouse gas emissions to avoid exceeding this “ceiling” of approximately 450 ppm-475 ppm of carbon dioxide (Hansen et al. 2006).

In order to stay within the ceiling, emissions must follow the “alternative,” rather than the “business as usual” greenhouse gas emissions scenario (Hansen 2006, Hansen et al. 2006, Hansen et al. 2007). In the business as usual scenario, carbon dioxide emissions continue to grow at about 2 percent per year, and other greenhouse gases such as methane and nitrous oxide also continue to increase. In the alternative scenario, by contrast, carbon dioxide emissions decline moderately between now and 2050, and much more steeply after 2050, so that atmospheric carbon dioxide never exceeds 475 parts per million. The alternative scenario would limit global warming to less than an additional 1° C in this century (Hansen et al. 2006, Hansen et al. 2007).

Since the year 2000, however, society has not followed the alternative scenario. Instead, carbon dioxide emissions have continued to increase by 2 percent per year since 2000 (Hansen et al. 2006, Hansen et al. 2007). This rate of increase itself appears to be increasing (Denman et al. 2007). If this growth continues for just ten more years, the 35 percent increase in carbon dioxide emissions between 2000 and 2015 will make it impractical if not impossible to achieve the alternative scenario (Hansen et al. 2006, Hansen et al. 2007). Moreover, the “tripwire” between keeping global warming to less than 1° C, as opposed to having a warming that approaches the range of 2° C to 3° C, may depend upon a relatively small difference in anthropogenic greenhouse gas emissions (Hansen et al. 2006, Hansen et al. 2007). This is because warming of greater than 1° C may induce positive climate feedbacks, such as the release of large amounts of methane from thawing arctic permafrost, that will further amplify the warming (Hansen et al. 2006, Hansen et al. 2007).

Just ten more years on current greenhouse gas emissions trajectories will essentially commit us to climate disaster. Dr. James E. Hansen, Director of the NASA Goddard Institute for Space Studies, and NASA’s top climate scientist, has stated:

“In my opinion there is no significant doubt (probability > 99 percent) that . . . additional global warming of 2° C would push the earth beyond the tipping point and cause dramatic climate impacts including eventual sea level rise of at least several meters, extermination of a substantial fraction of the animal and plant species on the planet, and major regional climate disruptions”

(Hansen 2006:30).

Studies that have used climate model projections to forecast species extinctions have predicted large species losses. Using a mid-range climate scenario, Thomas et al. (2004) predicted that 15 percent to 37 percent of species are already committed to extinction by 2050. Malcolm et al. (2006) estimated that 11 percent to 43 percent of endemic species in biodiversity hotspots will go extinct by the end of the century under a scenario of doubled carbon dioxide concentrations, which includes an average of 56,000 endemic plants and 3,700 endemic vertebrate species.

In order to avoid truly unacceptable consequences of global warming, we must stop the growth of greenhouse gas emissions, and, in relatively short order, begin reducing them. Achieving the reductions necessary to keep additional global warming between the years 2000-2100 within 1° C will be extremely challenging, and will require deep reductions in emissions from industrialized nations such as the United States. Until and unless the United States has adopted and begun to implement an effective and rational plan to reduce such emissions, we should not commit to further greenhouse gas emissions through additional oil and gas development.

2. Important Greenhouse gases

In addition to the documented impacts of CO₂ on the climate, there are additional important greenhouse gases contributing to climate change, that are especially relevant to the Arctic ecosystem and must be analyzed in more detail in the FEIS.

i. Methane

Methane release from natural and manmade sources due to the impacts from global climate change and from direct release and impacts due to oil and gas development and production may contribute a significant amount of greenhouse gas emissions to the atmosphere, and must be considered in the FEIS. Methane is a potent greenhouse gas and has contributed the second largest anthropogenic radiative forcing since pre-industrial times. Methane is a more effective greenhouse gas than CO₂ on a per molecule basis, and has the potential to contribute as much carbon to the atmosphere as fossil fuel emissions (Archer et al. 2007). Over a 100-year period, methane will trap about 23 times more heat than an equal amount of carbon dioxide (Albritton et al. 2001).

Since the industrial revolution, rapid increases in human activity have led to more than a doubling of atmospheric methane concentrations (Wuebbles and Hayhoe 2002). As a result of

human activities the atmospheric concentration of methane has increased by about 150 percent since 1750, continues to increase, and the current concentration of atmospheric methane has not been exceeded during the past 650,000 years (Forster et al. 2007). Anthropogenic sources account for about two thirds of emitted methane and include coal and gas production, agriculture, biomass burning, landfills, and animals (Quinn et al. 2007). There is also evidence that current carbon monoxide (CO) emissions are a cause of increasing methane concentrations (Denman et al. 2007). Both terrestrial and marine sources of methane gas release within the NPR-A have the potential to be significant contributors of greenhouse gases to the atmosphere, and rate of release is directly related to climate change impacts. Release of methane provides a feedback mechanism in conjunction with climate change, further contributing to global warming. As such, the complete lack of discussion in the DEIS of methane release and its contribution to climate change and how this may directly impact the NPR-A ecosystem is a huge oversight, which must be amended in the FEIS.

A warming climate can lead to the release of methane in terrestrial and marine areas, especially at northern latitudes. In the Arctic, measurements indicate that methane emissions are increasing due to higher temperatures and the resulting disappearance of permafrost and wetter soil conditions (Zimov et al. 2006). In regions of continuous permafrost, such as the NPR-A, global warming has resulted in a degradation of the permafrost and an increase in the size and number of thaw lakes. It has been estimated that this increase in lake area has led to a 58 percent increase in methane emissions (Walter et al. 2006). As discussed in detail below methane may be released through a variety of climate change and oil and gas development mechanisms, including release of methane hydrates from thawing permafrost or seafloor sources due to increased surface temperatures, release of organic matter from thawing permafrost, and release of natural gas from pipelines or other commercial operations.

Methane frozen into hydrate is found in vast reservoirs below the sea floor and in permafrost soils along the Arctic coastline (Archer et al. 2007). Methane hydrates are approximately 164 times more concentrated than methane gas, thus a small volume of methane hydrate could liberate large volumes of gas and contribute substantial amounts of greenhouse gas to the atmosphere (Ruppel 2009). In fact, the global hydrate reservoir is so large that if just 10 percent of the methane contained in this reserve were released in the next few years, the impact on the earth's radiation budget would be equivalent to a 10-fold increase in atmospheric CO₂ (Archer et al. 2007). Global warming effects have been found to destabilize these methane hydrates causing a release of methane into the water column and atmosphere (Biajstoch et al. 2011). Climate change will likely release methane stored in Arctic areas first, as the Arctic Ocean is expected to warm earlier than other ocean areas, partly because of albedo feedback from the melting Arctic ice cap. Release of methane hydrate deposits may also be triggered by deep-ocean warming or by submarine landslide, both of which are linked to warmer surface temperatures (Archer et al. 2007). Methane releasing from hydrates found under the seafloor often bubbles to the ocean surface, and is then added to the atmosphere (Archer et al. 2007). Methane that does not release to the surface is oxidized to CO₂ in seawater, further contributing to ocean acidification processes.

In terrestrial areas, recent studies have found large surface leaks of methane gas to the atmosphere from the Alaskan Arctic (Walter Anthony et al. 2012). These leaks are likely to

increase with global warming because current observations show that methane is escaping along the boundaries of permafrost thaw and receding glaciers, which are becoming more prevalent as temperatures increase at northern latitudes (Walter Anthony et al. 2012). With a carbon store of over 1,200 Pg (10^{15} grams), the methane reservoir in the Arctic is huge when compared with the global atmospheric methane pool of just 5 Pg (Walter Anthony et al. 2012).

In addition to release of methane hydrates, organic matter locked in frozen permafrost may add a substantial amount of methane to the atmosphere. If 20 percent of the peat reservoir in permafrost is converted to methane and released over the next 100 years, this would double the atmospheric methane concentration by releasing 0.7 billion tons of carbon per year. Leakage of methane gas from climate change induced permafrost melting will be significant within and nearby the NPR-A. Some of the most intense melting is already occurring along the Arctic Ocean (Nelson et al. 2002). Erosion of thermokarst lake edges and coastal erosion, both driven by climate change, also drive permafrost melting, and subsequent release of methane from permafrost. In parts of Alaska the coast is receding at rates of tens of meters per year (Jones et al. 2009). Leakage of methane from inland sources could thus have significant impacts on total greenhouse gas emissions and further contribute to climate warming.

The DEIS fails to consider direct anthropogenic leakage of natural gas. The FEIS should consider the impacts of methane gas emissions from gas development and extraction over the entire lifetime of the natural gas, and should also consider the impacts of oil and gas development on hydrology and permafrost and associated release of methane. In its brief and incomplete analysis in the DEIS, the BLM states that, “[w]hile it is not possible to know with confidence the impact of increased greenhouse gas emissions due to proposed operations within the planning area on global climate change, it is certain that it would contribute a very small amount to climate change” (DEIS 4.3.1.2). This analysis is inadequate in that not only does it not consider methane emissions from the direct development of natural gas, but it also does not even mention the impacts of oil and gas development on permafrost melting, erosion, and resulting methane release from permafrost or ocean sediment. Nor does the DEIS analyze the total contribution of oil and gas development in the NPR-A and oil and gas development offshore to worldwide greenhouse gas emissions, and their impact on permafrost melting and methane release.

The FEIS must include detailed analyses of the estimated methane emissions under each alternative, including methane that would be released from the permafrost and submarine deposits, and associated impacts on the Arctic ecosystem through contribution to greenhouse gas emissions and climate change. Analysis must include direct impacts from oil and gas extraction on NPR-A land, as well as impacts from offshore oil and gas extraction that would be enabled by infrastructure on the NPR-A. Additionally, analysis must include methane releases due to climate change caused melting sea ice, submarine landslide, and permafrost. The current analysis is flawed and incomplete, and severely underestimates methane emissions that will occur as a direct or indirect result of each alternative. As a result, the analysis in the DEIS does not fulfill NEPA requirements.

ii. Tropospheric ozone

Ozone functions both as a direct greenhouse gas, and as a controller of greenhouse gas lifetimes. It is thought to have caused around one third of all the direct greenhouse gas-induced warming since the industrial revolution. Modeling and studies provide evidence that tropospheric ozone concentrations have increased since pre-industrial times due to increases in emissions of anthropogenic ozone precursors, especially methane (Oltmans et al. 1998). Ozone that is produced in the northern hemisphere and mid-latitudes is most efficiently transported to the Arctic in the non-summer months. Local sources of ozone and its precursors in the Arctic and NPR-A region include marine vessel emissions, emissions from fossil fuel burning, oil and gas related support equipment, emissions from methane hydrates and releases of methane from permafrost, and emissions from gas pipelines infrastructure. Shipping emissions in the Arctic contribute directly to ozone levels, and have the potential to increase Arctic ozone levels by a factor of two or three relative to present day (Quinn et al. 2007).

Subarctic and Arctic ozone precursor emissions may be increasing as climate change causes boreal regions to warm, resulting in an increased frequency of fires in boreal areas (Kasischke et al. 2005). Fires emit large quantities of CO and non-methane volatile organic carbon (NMVOC) compounds which may combine with anthropogenic emissions in the same region to produce large amounts of ozone (Quinn et al. 2007). CO emissions from boreal fires in the spring and summer of 2003 made a substantial impact on ozone concentrations in the Arctic (Generoso et al. 2007). The projected increase in temperature and increased shrubbiness in tundra ecosystems, including that of the NPR-A, is predicted to increase fire frequency, severity and extent (SNAP 2011, Higuera et al. 2008).

Fire frequencies in the interior of Alaska are projected to be more strongly influenced by changes in vegetation patterns, which may significantly contribute to pollution levels in Arctic areas such as the NPR-A. For example, in April and May of 2006, record high concentrations of ozone were measured at the Zeppelin research station in Spitsbergen (Stohl et al. 2007). This severe air pollution episode was due to a combination of unusually high temperatures in the European Arctic and large emissions from agricultural fires in Belarus, Ukraine and Russia. As the warming of the Arctic continues to proceed more quickly than that of lower latitudes, transport of pollutants from interior Alaska or sub-arctic regions may become more frequent in the future, resulting in increased tropospheric ozone concentrations and a further increase in surface temperatures, creating a feedback mechanism (Quinn et al. 2007).

The DEIS fails to analyze the cumulative impacts from increased shipping activity, fire, permafrost melting, and release of methane from methane hydrate source, and from oil and gas extraction on tropospheric ozone concentrations and the resulting increase in climate warming and impact on wildlife and ecosystems of the NPR-A. Such analysis must be included in the FEIS and analyzed thoroughly for each alternative.

iii. Black Carbon

Black carbon is a significant contributor to Arctic warming that is not adequately considered in the DEIS. Black carbon, or soot, consists of particles or aerosols released through the inefficient burning of fossil fuels, biofuels, and biomass (Quinn et al. 2007). Unlike greenhouse gases, which warm the atmosphere by absorbing longwave infrared radiation, soot has a warming impact because it absorbs shortwave radiation, or visible light (Chameides and Bergin 2002). Black carbon is an extremely powerful greenhouse pollutant. Scientists have described the average global warming potential of black carbon as about 500 times that of carbon dioxide over a 100-year period (Hansen et al. 2007, Reddy and Boucher 2007). This powerful warming impact is remarkable given that black carbon remains in the atmosphere for only about four to seven days, with a mean residence time of 5.3 days (Reddy and Boucher 2007).

Black carbon contributes to Arctic warming through the formation of “Arctic haze” and through deposition on snow and ice, which increases heat absorption (Quinn et al. 2007; Reddy and Boucher 2007). Arctic haze results from a number of aerosols in addition to black carbon, including sulfate and nitrate (Quinn et al. 2007). The effects of Arctic haze may be to either increase or decrease warming, but when the haze contains high amounts of soot, it absorbs incoming solar radiation and leads to heating (Quinn et al. 2007).

Soot also contributes to heating when it is deposited on snow because it reduces the reflectivity of the white snow and instead tends to absorb radiation. A recent study indicates that the direct warming effect of black carbon on snow can be three times as strong as that due to carbon dioxide during springtime in the Arctic (Flanner 2007). Black carbon emissions that occur in or near the Arctic contribute the most to the melting of the far north (Reddy and Boucher 2007; Quinn et al. 2007).

Reductions in black carbon therefore provide an extremely important opportunity to slow Arctic warming in the short term, and mitigation strategies should focus on within-Arctic sources and northern hemisphere sources that are transported by air currents most efficiently to the Arctic. Conversely, allowing black carbon emissions to increase in the Arctic as the result of oil and gas development, increased shipping, or other industrial activity will accelerate Arctic warming and consequent loss of tundra ponds and the seasonal sea ice, contributing to the extinction of the polar bear and other species. Black carbon reductions will also provide air quality and human health benefits. Numerous direct and indirect impacts of the leasing proposed under the alternatives of the DEIS will result in substantial releases of black carbon in the Arctic. This factor is not considered in the DEIS, and must be thoroughly analyzed for each alternative in the FEIS.

3. Climate Change Impacts to the NPR-A

The rising temperatures in Alaska have significant repercussions for the species and resources of the NPR-A. In addition to atmospheric warming, greenhouse gas emissions are leading to warmer waters, sea level rise, rapidly melting sea ice, increased frequency of extreme weather

events, increasing ocean acidification, and higher incidence of tundra fires, all of which have negative impacts on the NPR-A environment and wildlife. Without considering these changes and how they will interact with the proposed alternatives, the BLM cannot make an informed decision about the relative impacts of the various alternatives.

Climate change and ocean acidification represent significant long-term threats to the survival of many of the species in the NPR-A. Climate change is affecting the far northern latitudes at a greater rate than the rest of the world. Over the past 50 years Alaska has warmed at more than twice the rate of the rest of the United States' average (USGCRP 2009). Annual average temperature in Alaska has increased 1.9°C, while winters have warmed by 3.5°C, which has contributed to earlier spring snowmelt, sea-ice loss, widespread glacier retreat, and permafrost warming (USGCRP 2009). This trend is expected to continue. Alaska's annual temperatures are projected to rise by an average of 4.5°C by the end of the century (range: 3°C -7.4°C) under a mid-level emissions scenario (Christensen et al. 2007: Table 11.1). These temperature changes will result in a variety of impacts to the vegetation and wildlife in the NPR-A.

As the following discussion of specific impacts of climate change in the NPR-A demonstrates, climate change is already impacting, and will continue to impact key species and resources of the NPR-A. Such changes are likely to lead to a reduction of available breeding habitat and prey for the threatened, endangered and sensitive species of the NPR-A, compromising their chances of survival and recovery. As the effects of global warming increase over the foreseeable future, these impacts will become all the more severe.

i. Sea Level Rise and Coastal Erosion

The climate change analysis conducted by Scenarios Network for Alaska and Arctic Planning (SNAP), for this DEIS, completely fails to include sea level rise or coastal erosion in its assessment. This failure to analyze sea level rise and coastal erosion is a major gap in the BLM's analysis of environmental impacts. The DEIS does briefly mention sea level rise during discussion of the impacts of climate change in the Affected Environment section, but does not analyze the effects of sea level rise in the context of oil and gas exploration and development in Environmental Consequences. Impacts from coastal erosion and sea level rise include a reduced terrestrial area, degradation of wildlife habitat, and direct impacts to construction and activities related to oil and gas exploration and extraction that may require changes in the location of development or additional mitigation measures. Erosion and inundation of freshwater ponds with brackish water will further degrade wildlife habitat. Decreases and degradation of wildlife habitat on the coastal plain from coastal erosion and sea level rise will adversely impact many wildlife species, including special status species, which use these plains as breeding, nesting, and feeding grounds. The FEIS must analyze impacts from coastal erosion and sea level rise in regards to wildlife habitat and combined with cumulative impacts from oil and gas development. The FEIS must also consider sea level rise and coastal erosion in regards to its impact on oil and gas infrastructure. Structures may become inundated by sea water, undermined by erosion, or rendered unstable by slumping and changes in soil stability.

Sea level rise in many regions of the Arctic is advancing much faster than the global average, with particularly rapid increases in sea level occurring in recent years (Richter-Menge et al. 2007). Although the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report projected a global mean sea-level rise in the 21st century of 18 cm – 59 cm, the IPCC acknowledged that this estimate did not represent a “best estimate” or “upper bound” for sea-level rise because it assumed a negligible contribution from the melting of the Greenland and west Antarctic ice sheets (IPCC 2007: 45). Recent studies documenting the accelerating ice discharge from the Greenland and Antarctic ice sheets indicate that the IPCC projections are a substantial underestimate (Hansen et al. 2006, Pritchard et al. 2009). Recent studies that have attempted to improve upon the IPCC estimates have found that a mean global sea level rise of at least one to two meters is highly likely within this century (Rahmstorf 2007, Pfeffer et al. 2008, Vermeer and Rahmstorf 2009, Grinsted et al. 2010, Jevrejeva et al. 2010). Studies that have reconstructed sea-level rise based on the geological record, including oxygen isotope and coral records, have found that larger rates of sea-level rise of 2.4 m to 4 m per century are possible (Milne et al. 2009). This map illustrates that a large portion of the important wildlife habitat of the coastal plain would be inundated under a four-meter sea level rise scenario. Critically, Teshekpuk Lake would be under sea water if this amount of sea level rise occurred. Therefore, protections of wildlife areas in the FEIS must take into consideration this predictable future loss of coastal plain, which could occur within the next 50 years, and include permanent protections for upland wildlife areas.

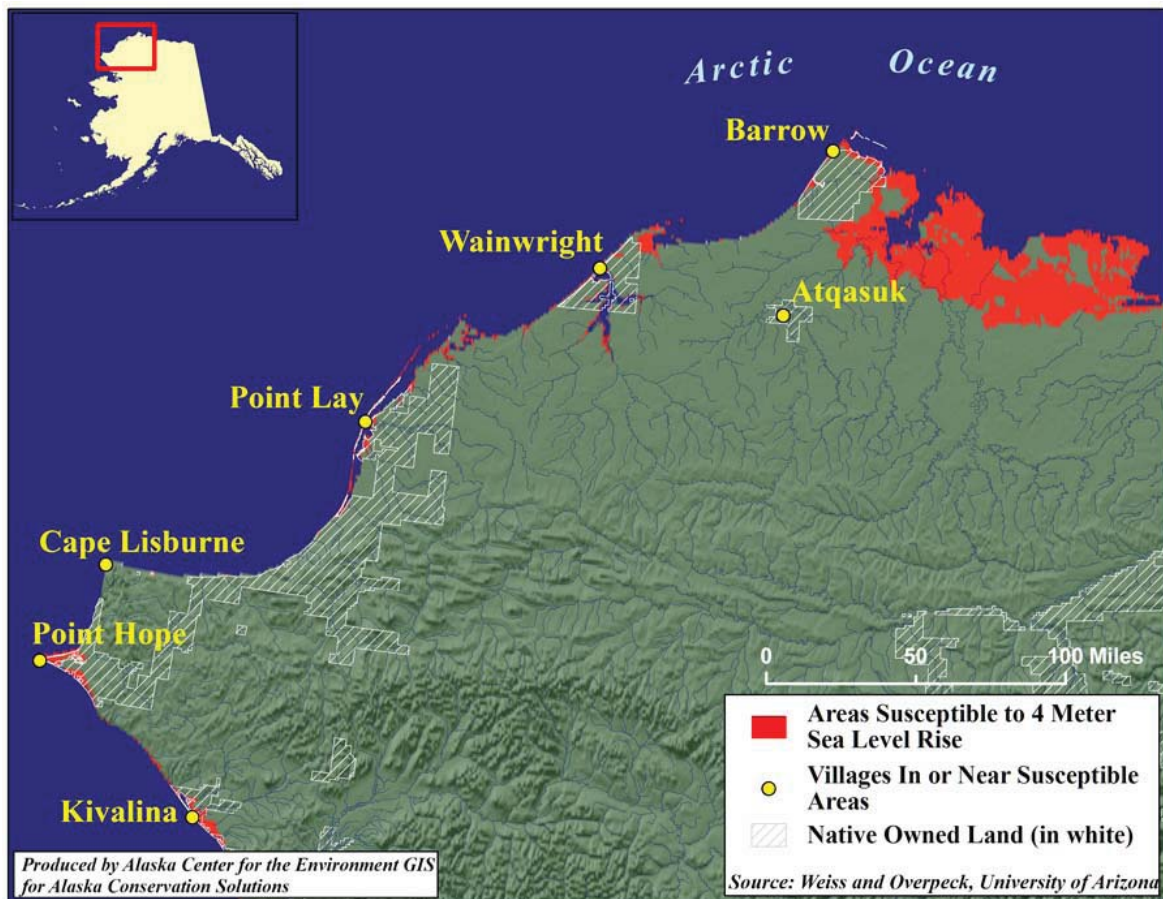


Figure 1. Areas susceptible to a 4 meter sea level rise in the NPR-A and North Slope of Alaska. Source: Weiss and Overpeck, University of Alaska. Produced by Alaska Center for the Environment GIS for Alaska Conservation Solutions. Available at: <http://northern.org/media-library/maps/arctic/arctic-climate-change-impacts-maps/GWSeaLevelRiseWestWEB1g.jpg/view>

In addition to sea level rise, Arctic shorelines are eroding at an accelerated rate due to the combined effects of sea-ice loss, increasing sea surface temperatures, increasing terrestrial permafrost degradation, rising sea levels, and increases in storm power and corresponding wave action (Jones et al. 2009). Increasing coastal erosion jeopardizes species such as the polar bear, caribou, walrus, seabirds and waterfowl that use coastal habitats within the NPR-A. Sea level rise is an especially important consideration in the northern portion of the NPR-A, where there is a vast array of wildlife, and the coastal plains are especially low-lying.

A recent published study documented a doubling of coastal erosion rates in the Teshekpuk Lake area. Mars et al. (2007) concluded that “most of this additional land loss is attributed to the breaching of thermokarst lakes by coastal erosion and the subsequent flooding of those thermokarst depressions by marine water.” Such loss of pond habitat is consistent with global warming:

the results are consistent with climate change trends that have resulted in warming of permafrost and shrinking summer pack ice in the Arctic Ocean. The former would render permafrost coastal bluffs and inland lakeshores more susceptible to erosion by waves and headward erosion of ephemeral streams, respectively, and the latter would increase wave fetch and contribute to more intense summer storms.

(Mars et al. 2007).

Another study documented a different climate-related dynamic that also results in the loss of waterbird breeding ponds such as those in the NPR-A. Smol et al. (2007) document the loss of Arctic ponds from desiccation in a warming climate. The effects on the ecosystem, and the eiders and loons dependant on that ecosystem are likely to be severe:

A key “tipping point” has now been passed: Arctic ponds that were permanent water bodies for millennia are now ephemeral. The ecological ramifications of these changes are likely severe, and will cascade throughout the Arctic ecosystem (e.g., waterfowl habitat and breeding grounds, invertebrate population dynamics and food for insectivores, drinking water for animals, etc.). Furthermore, lower water levels will have many indirect environmental effects, such as further concentration of pollutants. Ironically, high Arctic ponds, which are such important bellwethers of environmental change, are now disappearing because of climatic warming.

(Smol et al. 2007).

Such accelerated erosion represents a significant threat to the species and resources of the NPR-A that should have been evaluated in the DEIS. For example, the DEIS states that erosion along the Beaufort Sea coast and the shore of Teshekpuk Lake required a series of winter mobilizations to plug and abandon four wells (NPR-A DEIS 4.7.3.1). With scientifically based predictions of increases in coastal erosion and erosion of inland lakeshores, such incidents of erosion undermining oil and gas equipment are likely to become commonplace, with accompanied safety and spill issues. The FEIS must include analysis of these impacts and specific mitigation measures to limit the contributing impact oil and gas development may have on coastal and inland lakeshore erosion.

The DEIS must also include sea level rise and coastal erosion in its impact analyses and stipulations for best management practices. Inundation by seawater, and coastal erosion would have major impacts under all alternatives, and would be exacerbated by oil and gas development on the coastal plain. Additionally, the cumulative impacts from greenhouse gas emissions from the oil and gas throughout its lifecycle, and contribution to climate warming and sea level rise in the Arctic, must be included in analysis.

ii. Melting Sea Ice

Climate change is dramatically affecting sea ice in the Arctic, an important habitat element for many animals in the NPR-A. The lowest summer sea ice minimum on record was reached on September 16, 2007. The record low of 4.13 million square kilometers (1.59 million square miles) was far less than the previous record low of 5.32 million square kilometers (2.05 million square miles) in 2005 (NSIDC 2007). The last five years (2007-2011) have been the five lowest summer sea ice minima on record. Sea ice extent is important for a variety of animals in the NPR-A and adjacent waters, including polar bears and ice seals. The EIS must thoroughly analyze the impacts to these species of losing their sea ice habitat.

iii. Ocean Acidification

The oceans are acidifying at an alarming rate, with particularly profound impacts in Northern waters. The world's oceans are an important part of the planet's carbon cycle, absorbing large volumes of carbon dioxide and cycling it through various chemical, biological, and hydrological processes. The oceans have thus far absorbed approximately 30 percent of the anthropogenic carbon dioxide emitted since the beginning of the industrial revolution (Feely et al. 2004). A primary impact of ocean acidification is that it depletes seawater of the carbonate compounds aragonite and calcite that many marine creatures need to build shells and skeletons (Orr et al. 2005, Fabry et al. 2008, Feely et al. 2009). As a result, ocean acidification hinders organisms such as corals, crabs, seastars, sea urchins, and plankton from building the protective armor they need to survive. Rising acidity also affects the basic functions of fish, squid, invertebrates, and other marine species and has detrimental effects on metabolism, respiration and photosynthesis, which can thwart growth and lead to higher mortality (Fabry et al. 2008). Because of its serious impacts to so many species, ocean acidification threatens to disrupt the entire marine food web.

Furthermore, an ever-growing body of scientific studies indicates that ocean acidification is affecting the Arctic more rapidly and is profoundly altering Arctic waters. The scientific evidence is as follows: (1) ocean acidification is a predictable consequence of rising atmospheric CO₂ (Feely et al. 2009); (2) the waters of the high-latitude Pacific-Arctic region are among the most vulnerable to ocean acidification because mixing and lower temperatures create conditions with lower pH and saturation state values (Fabry et al. 2009, Mathis 2011); (3) seasonal aragonite undersaturation is already occurring in the Bering Sea (Fabry et al. 2009, Mathis 2011, Mathis et al. 2011 a,b); (4) a variety of species, including fish, squid and crustaceans are negatively impacted by ocean acidification in laboratory experiments at acidification levels expected in this century (Fabry et al. 2008, Guinotte et al. 2008); and (5) ocean acidification is irreversible for tens of thousands of years after emissions cease (Richardson et al. 2009).

The first obvious declines will affect the especially vulnerable planktonic species, foraminifera and pteropods, which form calcium carbonate shells in the form of aragonite and have been found to be susceptible to increased ocean acidification, and the resulting undersaturation of the forms of calcium carbonate required to form their exoskeletons. These planktonic species are abundant in Alaskan waters and form the basis of the marine food chain. Reductions in the production of planktonic species due to increased CO₂ emissions and resulting ocean acidification processes could negatively impact all species in the marine food chain, including salmon, other fish species, coral, whales, seals, walruses, polar bears, and other Alaska wildlife species.

When burned for heat or energy, natural gas and oil produce vast amounts of CO₂, which contribute to ocean acidification. The FEIS must include analysis of contributions to ocean acidification from the entire lifecycle of oil and gas development in the NPR-A, and from offshore oil and gas development enabled by infrastructure on the NPR-A. Ocean acidification will have profound impacts on the Arctic marine food chain. These impacts from climate change and acidification are not speculative or in the distant future; they are happening now. Virtually no species in the NPR-A will be unaffected over the coming decades.

iv. Changing climate and fire dynamics

Tundra burning impacts vegetation composition, nutrient cycling, and permafrost, and is an important feedback mechanism linking CO₂-induced climate warming to Arctic environmental change (Mack et al. 2011, Higuera et al. 2011). Tundra fires may also impact subsistence resources, including caribou populations (Joly et al. 2010). There is increasing evidence linking Arctic warming and loss of sea ice to tundra fire regimes. In 2010 the largest number of fires on record occurred in the Noatak National Preserve, which is located just south of the NPR-A, above the Arctic Circle by the Brooks Range in Northern Alaska (Hu et al. 2010, Higuera et al. 2011). As climate warming trends continue, it is expected that tundra fires will increase north of this area, including the NPR-A.

A warming climate will cause rapid permafrost degradation (Lawrence et al. 2006), enhance drainage in upland tundra ecosystems, and increase shrub cover, further exacerbating susceptibility of tundra to late season fires (Higuera et al. 2008, Hu et al. 2010). Recent studies have demonstrated the direct biological and physical impacts of tundra fires on arctic ecosystems

(Liljedahl et al. 2007). Notably, studies find that the rare incidence of large and severe fires in the tundra biome has been an important contributing factor to the role of tundra ecosystems as a major carbon sink over ecological history (Zimov et al. 2006). As tundra fires increase, there will be an associated release of soil carbon, which may alter the role of tundra ecosystem in the global carbon cycle (Hu et al. 2010). As a result, the tundra ecosystem may no longer function as a CO₂ sink and instead become a CO₂ source, as stored CO₂ is released.

The DEIS fails to properly analyze the significant role fire may play on the future ecological conditions in the NPR-A, and the impacts these changing conditions may have on wildlife species, especially those dependent on lichens as a food source. The SNAP analysis used as a basis for the DEIS estimates a slight increase in fire probability by 2100, and the Affected Environment section includes fire as a serious threat to terrestrial mammals, but this analysis fails to include the risks of increased fires in interior Alaska and resulting increased air pollution in the Arctic, and also fails to accurately project the future risk of fire due to sea ice melt and drying of the tundra ecosystem. Thus, tundra and boreal forest burning impacts are not adequately assessed in the Environmental Consequences section. Additionally, increased fire intensity and frequency in the NPR-A land area itself will intensify oil and gas development's impacts on permafrost, vegetation, and wildlife, and alter the CO₂ feedbacks, resulting in a substantially increased release of greenhouse gases. The impact of increased greenhouse gases, especially methane, related to tundra and boreal burning must be analyzed in the FEIS.

4. Economic Costs of Greenhouse Gas Emissions Must Be Considered

In its NEPA analysis, BLM should have evaluated the economic costs of greenhouse gas emissions from both the exploration and extraction activities as well as the consumption of the produced oil and gas. Important peer-reviewed literature exists on estimating the social costs of climate change and quantifying the cost of carbon dioxide emissions (Stern 2006). As this field has developed, the methodology and inclusiveness of economic studies has improved. At the same time, the scientific understanding of global warming impacts and predictive ability has also improved. The result is that the estimated cost of greenhouse gas emissions in the literature has increased steadily, and we now know that the cost of continued greenhouse gas emission trajectories would be astronomical (Stern 2006). While monetizing the impact of greenhouse gas emissions cannot substitute for a full discussion of all impacts under NEPA, an estimate of the economic costs should be included.

Researchers have concluded that \$73/tc² (year 2010) is a reasonable figure for decision makers to use as a lower benchmark of the economic cost of greenhouse gas emissions, but this figure rises sharply over time (Downing et al. 2005). An upper benchmark is more difficult to deduce from the current literature, but the risk of higher values for the social cost of carbon is significant (Downing et al. 2005, Watkiss et al. 2005). One widely respected report commissioned for the British government recommended that decision makers use the range of values displayed in Table 1.

² tc tonne carbon 3.664 tons of carbon dioxide.

Table 1: Economic Cost of Carbon: Values for Use in Project Appraisal (USD per ton carbon) (Source: Adapted from Watkiss et al. 2005:ix)³

Year of Emission	Central Guidance	Lower Central Estimate	Upper Central Estimate
2000	\$101	\$64	\$238
2010	\$119	\$73	\$293
2020	\$146	\$91	\$375
2030	\$183	\$119	\$475
2040	\$256	\$165	\$603
2050	\$384	\$238	\$768

The Stern Review of the Economics of Climate Change, another comprehensive report commissioned by the British government, recently concluded that allowing current emissions trajectories to continue unabated would eventually cost the global economy between five and 20 percent of GDP each year within a decade, or up to \$7 trillion, and warned that these figures should be considered conservative estimates (Stern 2006). By contrast, measures to mitigate global warming by reducing emissions were estimated to cost about one percent of global GDP each year (Stern 2006). The DEIS's utter failure to look at the economic costs of the greenhouse gas emissions generated by the various alternatives violates NEPA. This analysis must be included in the FEIS. Analysis must calculate estimated GHG emissions by alternative, based on the above discussion of GHGs and using a full life-cycle estimate of emission produced from any oil and gas produced at NPR-A and related sites (e.g., offshore development).

C. Impacts on wildlife

The actions considered under the DEIS will have significant direct and cumulative impacts on wildlife in the NPR-A, including many species of birds, caribou, wolverine, polar bears, ice seals, and walruses. The DEIS's treatment of this issue is inadequate. The proposed lease sales under all alternatives in the DEIS and the resultant greenhouse gas emissions are consistent with the business as usual scenario that will lead to polar bear, ice seal and walrus extinction (Hansen et al. 2006, Hansen et al. 2007). Just ten more years on current greenhouse gas emissions trajectories will essentially commit us to climate disaster that will impact not just sea-ice dependent species, but all Arctic wildlife. GHG emissions and climate change will result in widespread changes to the ecosystem dynamic of the NPR-A, changing vegetation, seasonal timing, and precipitation patterns. Ocean acidification will impact important calcifying plankton at the base of the Arctic marine food web, with widespread repercussions on marine life, including seabirds. In the FEIS, the BLM must analyze not just the direct impacts of oil and gas leasing in the NPR-A and subsequent exploration, development and production, on wildlife, but also the greenhouse emissions of the oil and gas produced from these sales. Also, the FEIS must include

³ Figures from Watkiss et al. 2005:ix were converted from GBP (£) to USD (\$) with the exchange rate calculator at http://coinmill.com/GBP_USD.html on July 18, 2006 and rounded to the nearest dollar.

analysis of the cumulative impacts of climate change on species, broken down by each alternative and taking into account the lease sales' impact on greenhouse gas emissions and global climate change. The rising temperatures in Alaska have significant repercussions for the species and resources of the NPR-A. Major impacts will occur within the next 50 years for most Arctic species, and this must be included in the FEIS analysis.

1. Endangered Species Act

Section 7 of the ESA requires that BLM consult with the appropriate wildlife services agencies to ensure that the lease sales do not jeopardize threatened or endangered species or adversely modify their critical habitat. 16 U.S.C. § 1536(a)(2). Section 7 consultation is required for “any action [that] may affect listed species or critical habitat.” 50 C.F.R. § 402.14. Agency “action” is defined in the ESA’s implementing regulations to include

all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas. Examples include, but are not limited to: (a) actions intended to conserve listed species or their habitat; (b) the promulgation of regulations; (c) the granting of licenses, contracts, leases, easements, rights-of-way, permits, or grants-in-aid; or (d) actions directly or indirectly causing modifications to the land, water, or air.

50 C.F.R. § 402.02. *See also Pacific Rivers Council v. Thomas*, 30 F.3d 1050, 1054-55 (9th Cir. 1994), *cert. denied*, 514 U.S. 1082 (1995) (recognizing that Congress intended “agency action” to be interpreted broadly, admitting of no limitations).

When a proposed action may affect a protected species, consultation must occur and be completed *before* the federal action may take place. *Pacific Rivers*, 30 F.3d at 1056; *Thomas v. Peterson*, 753 F.2d 754, 764-65 (9th Cir. 1985). The action agency consults with the appropriate wildlife agency. The National Marine Fisheries Service (NMFS) has primary responsibility for administering the ESA with regards to most marine species, including whales and most marine mammals, while the U.S. Fish and Wildlife Service (FWS) has responsibility for terrestrial species, as well as some marine mammals, and all seabirds. During the course of consultation, NMFS or FWS may “suggest modifications” to the action to “avoid the likelihood of adverse effects” to the listed species. 50 C.F.R. § 402.13. At the completion of consultation, NMFS or FWS issues a Biological Opinion (BO) that determines if the agency action is likely to jeopardize the species. *See* 50 C.F.R. § 402.02. If so, the agency may not proceed with any program, permit, or decision that would jeopardize a species’ survival unless the BO specifies reasonable and prudent alternatives that will avoid jeopardy and allow the agency to proceed with the action. 16 U.S.C. § 1536(b). *See also Sierra Club v. Marsh*, 816 F.2d 1376, 1384-86 (9th Cir. 1987) (enjoining highway construction because agency could not meet burden of absolute assurance that mitigation required to avoid jeopardy was possible).

Although procedural, consultation is the backbone of the ESA. As the Ninth Circuit recognized, “[o]nly by requiring substantial compliance with the act’s procedures can we effectuate” congressional intent to protect species. *Sierra Club v. Marsh*, 816 F.2d at 1384 (9th Cir. 1987).

The opening up of any areas of the NPR-A to oil and gas lease sales affects ESA-listed species. Numerous listed species inhabit the NPR-A and adjacent waters. These include the bowhead whale, humpback whale, fin whale, polar bear, and spectacled and Steller’s eiders. Additionally, the ringed seal, bearded seal, Pacific walrus, yellow-billed loon and the Kittlitz’s murrelet have been petitioned for listing and are likely to be listed during the implementation of the proposed lease sales. Moreover, these species as well as other listed species are vulnerable to global warming, and therefore the greenhouse gas emissions of the leases may affect species. BLM must complete consultation with NMFS and FWS on the impacts of both the direct impacts (e.g., noise, oil spills) and indirect impacts (greenhouse gas emissions) of the lease sales and other management decisions regarding the NPR-A. Furthermore, any action to lease areas around Teshekpuk Lake is inconsistent with the agency’s obligation to avoid jeopardizing Steller’s and spectacled eiders.

i. Impacts on Threatened Polar Bears

The EIS must analyze the direct, indirect and cumulative impacts on ESA-listed polar bears. Polar bears are completely dependent on sea ice for hunting, migration, and other activities necessary for their survival. Due to global warming, the habitat of the polar bear is literally melting away (ACIA 2004, Derocher 2004). The United States Geological Survey concluded that reduced sea ice would result in loss of approximately two-thirds of the world’s polar bear population within 50 years, including all of Alaska’s polar bears (Amstrup et al. 2007). Oil and gas activities in the NPR-A and their resultant greenhouse gas emissions will contribute to polar bear extinction. BLM must analyze not only the direct impacts of oil and gas activities in the NPR-A on the polar bear, but also the greenhouse emissions of the oil and gas produced from these activities. Additional research and impact analysis must also be conducted in light of the recent observations of diseased polar bears, and the developing possibility of a unique mortality event for polar bears in the NPR-A.

ii. Impacts on Ice Seals

Ice seals, including ribbon seal, bearded seal, spotted seal, and ringed seal, are dependent on sea ice for survival, and threatened by many human activities including shipping, oil and gas development, and hunting. Climate change is the largest threat of all, and if greenhouse gas emissions continue at the current rate, scientist predict that sea ice in the seals’ ranges could decline 40 percent by mid-century, leading to widespread pup mortality (Holland et al. 2006, Wang and Overland 2009). Oil and gas activities in the NPR-A and their resultant greenhouse gas emissions will contribute to ice seal extinction. Ice seals also face severe and immediate threats from offshore oil and gas developments, which have the potential to destroy or modify large portions of the seals’ foraging and breeding habitat and exert lethal and sub-lethal impacts on population from oil and noise pollution and through direct disturbance and harassment (Fair and Becker 2000). Ocean acidification, which is predicted to increase rapidly in the Arctic

waters, may disrupt the marine food chain, resulting in widespread and deadly impacts to ice seals (Orr et al. 2005).

Offshore oil and gas development would be enabled by infrastructure in the NPR-A, and these impacts to ice seals must be analyzed in the FEIS. The FEIS must also analyze the total contributions of greenhouse gas emissions enabled by or directly resulting from oil and gas development within the NPR-A, broken down by each alternative. BLM must analyze not only the direct impacts of oil and gas activities in the NPR-A on polar bear, but also the greenhouse gas emission of the oil and gas produced by these activities and the activities that may occur in the Chukchi and Beaufort seas, that would be enabled by infrastructure on the NPR-A. Additional research, impact analysis, and mitigation measures, including permanently protected areas and caps on total greenhouse gas emissions resulting from the oil and gas development must also be conducted in light of the developing unique mortality event in ice seals, and the unknown but possibly spreading deadly disease process recently observed in these seals.

a. Ribbon Seal

In 2007, the Center filed a petition with NMFS to protect the ribbon seal under the ESA due to threats to its habitat from global warming. In December, 2008, NMFS denied the ribbon seal ESA protection, despite overwhelming scientific evidence showing the ribbon seal was in danger of extinction due to climate change. In September 2009, the Center and Greenpeace filed suit against the National Oceanic and Atmospheric Administration for denying protections to ribbon seal. Pursuant to a settlement agreement, NOAA will release a new 12-month finding on ESA listing of this species by December 10, 2012. The ribbon seal depends on sea ice for crucial activities, from resting to molting to raising young. The ribbon seals' winter sea-ice habitat in the Bering and Okhotsk Seas is predicted to decline by 40 percent by mid-century under a mid-level emissions scenario (Wang and Overland 2009). Impacts to ribbon seals from oil and gas development in the NRP-A are dismissed in the DEIS because ribbon seals occur far offshore. However, the DEIS did not consider impacts to the species resulting from oil and gas development greenhouse gas emissions and their contribution to climate change. The FEIS must analyze impacts to ribbon seals by alternative based on the greenhouse gas emissions that would be produced or enabled by each alternative. Cumulative impact analysis must reflect this.

b. Ringed, Spotted and Bearded Seals

The Center petitioned NMFS to grant ESA protection to bearded, ringed, and spotted seals in 2008. On October 21, 2010, the Obama administration finalized protection for the spotted seal in China and Russia, but denied protection for the spotted seal in the United States (75 FR 65239). On December 3, 2010, NMFS proposed ESA protection for bearded and ringed seals (75 FR 7746, 75 FR 77496). A final listing decision was due on June 10, 2012, and should come out at any time (76 FR 77476). Ringed, spotted and bearded seals are dependent on sea ice for biological life functions. The Bering, Okhotsk, and Barents Seas are projected to lose at least 40 percent of winter sea-ice area by 2050 (Wang and Overland 2009). Any remaining sea-ice habitat will likely be of low quality because the sea ice will be thinner and the ice will melt

sooner, leading to breakup of the sea ice during the reproductive and molting periods. The DEIS fails to analyze the impacts from oil and gas lease development caused greenhouse gas emissions on ringed, spotted and bearded seals. It also fails to acknowledge that greenhouse gas emissions resulting from development on or enabled by NPR-A leases could contribute to climate change. The DEIS states that the “effects of climate change on . . . ringed and bearded seals are uncertain.” This is despite a pending listing of threatened under the ESA for bearded and ringed seals, and a huge body of scientific evidence showing that ringed, spotted and bearded seals are under threat of extinction by mid-century due to climate change-induced sea ice loss and other factors, including increased oil and gas development in the area. The FEIS must analyze impacts to ringed, bearded and spotted seals by alternative based on the GHG emissions that would be produced or enabled by each alternative. Once a listing decision is issued for these species by NMFS, the FEIS must be amended based on these species’ listing status. Cumulative impact analysis must reflect this.

iii. Impacts on Pacific Walruses

The DEIS acknowledges that the main concern for the Pacific walrus population is climate change, which is causing a dramatic loss of its sea ice habitat and has a potential to change prey distribution and abundance. The DEIS also states that walruses are utilizing coastal areas differently due to the lack of late summer sea ice. The DEIS states that the K-6 Stipulation applies to alternatives B through D, but that a pipeline development corridor could be sited anywhere along the Chukchi coastline under alternative D. Although the DEIS goes on to acknowledge that the combined threats to walrus, including offshore oil and gas development and emerging diseases could become “significant in combination with future effects of climate change,” there is no analysis of how different alternatives may contribute to climate change and to other threats. This analysis must be included in the FEIS.

In February, 2008, The Center petitioned the FWS to protect the walrus under the ESA. On February 8, 2011, the FWS announced that listing the Pacific walrus was warranted but precluded and delayed protection for this species indefinitely by putting the walrus on the candidate list (76 FR 7634). Pursuant to a settlement agreement, FWS will make a listing decision by 2017. Thus, the FWS acknowledges that the Pacific walrus is deserving of protection. The FEIS should consider additional protections for Pacific walrus, including but not limited to, permanent wildlife refuge designation for critical walrus habitat along the length of the Chukchi coastline, especially Kassegaluk Lagoon, and a cap on greenhouse gas emissions enabled by, or tied to oil and gas leases. This is due to the documented negative impacts on walruses from climate change-caused lack of sea ice and other climate change issues (Cooper et al. 2006). These protections must be stronger than the suggestions for Special Areas in the DEIS, so that oil and gas lease sales will never be allowed to occur in these important walrus habitat areas.

2. Unusual Mortality Event

In the last 12 months, there have been several outbreaks of skin lesions resulting in unusual

mortality events in Alaska's marine mammals, particularly ice seals. On October 13, 2011, National Oceanic and Atmospheric Administration (NOAA) scientists observed a skin lesion disease outbreak in ringed seals. On December 20, 2011, NOAA and FWS declared an unusual mortality event involving multiple species including ice seals and walruses after scientists observed more than 60 dead ringed seals and more than 75 diseased seals in the Bering Sea and Arctic Alaska. Scientists also observed diseased and dead walruses at a mass haul-out near Point Lay.

This disease appears to be persisting in ice seal populations to present, resulting in illness and mortality. On March 7, 2012, a news release by NOAA reported that a ringed seal pup was captured in Yakutat, AK, with similar skin and fur loss symptoms to diseased seals in the Arctic (NOAA 2012). As the spring 2012 subsistence harvest of marine mammals continues, more diseased animals are likely to be observed. Winter conditions in 2011-2012 made for extremely unsuitable conditions for making observations in the Arctic and Bering Sea. Thus, the current status of the disease, and how it may have affected winter survival for marine mammals, is unknown (NOAA 2012). Once the summer field season research is completed, more information on the origins of the disease may be available, and must be included in the FEIS.

Polar bears may also be affected by a similar disease, manifested by hair loss and skin lesions that appear very similar to lesions found in diseased seals. As of April 6, 2012, field scientists had found hair loss on nine of the 33 bears they had captured. Unlike diseased seals and walruses, the bears with skin lesions appear to be healthy otherwise (Feidt 2012).

The cumulative impacts of the ongoing unusual mortality events for Arctic marine mammals must be considered in the EIS, as they may have significant adverse impacts on ice seal, polar bear and walrus populations. Even if the disease does not directly result in mortality of affected polar bears, impacts to ice seals, the bear's primary prey, could significantly impact polar bear survival, reproductive success, and overall population numbers. While the cause of the disease is unknown, thus far it has not been linked to any known viruses, bacteria or radiative causes (NOAA 2012). This disease may be linked to increased susceptibility of marine mammals to normally non-disease causing pathogens due to a variety of increased stressors from climate change, increased human activity (especially shipping and oil and gas operations), and higher levels of pollutants in the Arctic (Heimel 2012). Stress related to climate change and human disturbance can have a variety of effects on an organism, one of which is to reduce resistance to disease (Martin et al. 2010). The illness may simply be a manifestation of these stressors. Marine mammals that otherwise would be resistant to a common pathogen (possibly bacterial or fungal in origin) may become susceptible when stressed by the rapidly changing and developing conditions in the Arctic.

Thus, offshore drilling activities that would be enabled by infrastructure on the NPR-A, in addition to the stressors that will occur with climate change (as described above) could increase the incidence of mortality events for marine mammals in the Arctic. Stressors on marine mammals may also be directly related to development and exploration activities on the NPR-A land area, which increases a variety of stressors on wildlife, including sound, direct human-caused disturbance, degradation of habitat due to development and increased release of methane and other greenhouse gases. Because of the strong link between NPR-A oil and gas development

and offshore oil and gas development that would both act as a cumulative impact and be directly enabled by infrastructure on the NPR-A, the recent and ongoing unusual mortality events for Arctic marine mammals must be discussed both in the cumulative impacts section, and in direct environmental consequences of any alternative that increases oil and gas development in the Arctic, including the “no action” alternative.

Because the unusual mortality event is a developing issue, involving difficult-to-study and remote populations of marine mammals, the EIS must be updated after this winter’s (2011 to 2012) mortality and disease data is compiled and when and if a disease pathogen is identified by scientists. If the disease continues to progress and result in high levels of mortality for the already stressed ice seal, walrus and polar bear populations, new mitigation measures and protected habitat areas must be included in the FEIS. Lease sales of any part of the NPR-A based on the current DEIS impact and mitigation statements must not be completed until this unusual mortality event is included.

D. Alternatives and Mitigation

1. Range of Alternatives

BLM did not consider a reasonable range of alternatives and mitigation measures to reduce impacts on the environment. NEPA requires that the EIS “‘rigorously explore and objectively evaluate *all* reasonable alternatives’ to a proposed plan of action that has significant environmental effects. 40 C.F.R. § 1502.14(a) (2000). This is ‘the heart’ of an EIS.” *Natural Resources Defense Council v. U.S. Forest Service*, 421 F.3d 797, 813 (9th Cir. 2005). The purpose of NEPA’s alternatives requirement is to ensure agencies do not undertake projects “without intense consideration of other more ecologically sound courses of action, including shelving the entire project, or of accomplishing the same result by entirely different means.” *Env’t Defense Fund., Inc. v. U.S. Army Corps. of Eng’rs*, 492 F.2d 1123, 1135 (5th Cir. 1974); *see also, City of New York v. Dept. of Transp.*, 715 F.2d 732, 743 (2nd Cir. 1983) (NEPA’s requirement for consideration of a range of alternatives is intended to prevent the EIS from becoming “a foreordained formality.”); *Utahns for Better Transportation v. U.S. Dept. of Transp.*, 305 F.3d 1152 (10th Cir. 2002), *modified in part on other grounds*, 319 F.3d 1207 (2003). Whether an alternative is “reasonable” or not turns on whether it will accomplish the stated purpose for the project. *City of Carmel-By-The-Sea v. U. S. Dep’t of Transp.*, 123 F.3d 1142, 1155 (9th Cir. 1997).

Importantly, this evaluation extends to considering more environmentally protective alternatives and mitigation measures. *See, e.g., Kootenai Tribe of Idaho v. Veneman*, 313 F.3d 1094, 1122-1123 (9th Cir. 2002) (and cases cited therein). NEPA regulations require that alternatives “include appropriate mitigations measures.” 40 C.F.R. § 1502.14(f). Additionally, the regulations require that the analysis of environmental consequences discuss “means to mitigate adverse environmental impacts.” 40 C.F.R. § 1502.16(h).

An environmental review document must fully disclose and analyze impacts to any listed, candidate, or sensitive species, and discuss alternatives and enforceable mitigation measures to avoid, reduce, and mitigate impacts to the species.

Under this standard, BLM's range of alternatives is inadequate. For example, BLM should have considered alternatives that promote the reduction of greenhouse gas emissions, such as limiting lease sales. The DEIS completely failed to do this, even failing to include a viable no-action alternative that would simply not allow any lease sales in the NPR-A.

An alternative in which no further leasing in the NPR-A occurs, until and unless it is part of and consistent with a national plan to reduce greenhouse gas emissions by 80 percent by 2050, the levels top climate scientists such as Dr. Hanson indicate are necessary to avert the most disastrous impacts of global warming, is a completely reasonable alternative. In fact, it is an absolutely essential alternative if we as a nation are to successfully address the climate crisis. The failure to analyze such an alternative, or for that matter any alternatives that increase environmental protections in the NPR-A, itself is evidence of an inadequate NEPA process.

2. The No Action Alternative

The "no-action" alternative included in DEIS analysis does not fulfill BLM's obligation under NEPA, thus rendering subsequent analysis of the Environmental Consequences under each alternative inaccurate and incomplete. NEPA requires that alternative analysis in the EIS "include the alternative of no action." 40 C.F.R. § 1502.14(d). Under NEPA, "no action" means that the proposed activity would not take place. The purpose of the "no action" alternative is to provide a benchmark, enabling decisionmakers to compare the magnitude of the environmental effects of the action alternatives. Inclusion of such an analysis in the DEIS is necessary to inform Congress, the public, and the president as intended by NEPA. 40 C.F.R. § 1500.1(a). Because there is currently no commercial oil and gas development in the NPR-A, the current "no action" alternative is an "action" alternative, as defined by NEPA, rather than a baseline. A valid "no action" alternative would be an alternative that provides for no leasing and for no commercial oil and gas development to occur. This baseline would describe conditions currently and historically occurring at the NPR-A, where there are no commercial oil and gas developments.

In the DEIS, all alternatives, including the so-called "no action" alternative, allow for an "action" of oil and gas lease sales that would result in the construction of permanent infrastructure and would directly lead to degradation of wildlife habitat and ecological resources in vast swathes of the NPR-A, affecting from 50 percent to 100 percent of the land area depending on the alternative. As described in the DEIS, the very foreseeable activities associated with oil and gas development would have major impacts on ecological resources. Such impacts have not occurred at any time in the history of the NPR-A. Thus, labeling Alternative A, which would open up over 50 percent of the NPR-A to oil and gas leasing, a "no action" alternative does not meet BLM's NEPA obligations.

By framing the alternatives this way, BLM avoided its obligation under NEPA to evaluate the potential impacts of the proposed action. Alternative A as the "no action" alternative assumes

very similar levels of activity as Alternative B. This denies BLM and the public a baseline from which to analyze the impacts of the “action” alternatives. The establishment of the baseline biological condition of an affected area is a practical requirement of the NEPA process because “without establishing . . . baseline conditions . . . there is simply no way to determine what effect [an action] will have on the environment, and consequently, no way to comply with NEPA.” *Half Moon Bay Fisherman’s Mktg. Ass’n v. Carlucci*, 857 F. 2d 505, 510 (9th Cir. 1988). By using a false “no action” alternative that assumes a baseline of activity that has not yet occurred, BLM illegally avoids its obligation under NEPA to consider the impacts of its actions.

E. The Designation of Special Areas

The Special Areas recommended in Alternative B are simply suggestions, with no permanent protections for these areas. The weak protections provided by the Special Area designation could be readily changed by successive administrations. The BLM says as much, and states that “Special Area designation does not itself impede oil and gas development” (NPR-A DEIS 2.4.4) and that “Special Area designation itself does not impose specific protections” (NPR-A DEIS 2.1.2). Thus, according to the DEIS, it appears that designated Special Areas could be opened to oil and gas development without any changes to the Special Area designation. This highlights the complete lack of any real protection from oil and gas development provided by this designation. As written, these protections are profoundly weak, and do little, if anything, to prevent permanent oil and gas development anywhere in the Reserve, including Special Areas.

The Center and other groups have requested that the BLM provide permanent protections for special areas, by establishment of wildlife refuges, Wilderness designations, or legislatively protected BLM areas (i.e., Wild Lands designations). The DEIS dismisses these requests, stating that a Wilderness designation is “beyond the scope of this planning effort” (NPR-A DEIS 2.4.1), that the BLM no longer considers Wild Lands in its planning process (NPR-A DEIS 2.4.2), and that National Wildlife Refuge establishment is “beyond the scope of this planning effort” (NPR-A DEIS 2.4.6). These dismissals are put forth with no explanation or discussion, and therefore do not fulfill the need of a planning document as a true document of the planning process. Rather than the nonbinding measures currently put forth in the DEIS, the FEIS should include a definitive statement of administrative policy on this matter. Based on reasons discussed in great detail throughout this comment letter, we believe that the FEIS should include clear, meaningful, and permanent protections for all Special Areas proposed in Alternative B, along with permanent protections for additional ecologically important areas in the NPR-A.

F. Cumulative Effects

NEPA requires a thorough analysis of cumulative effects. The DEIS fails in this regard as well. The most significant cumulative effects to the resources of the NPR-A are those associated with global warming as discussed above. The DEIS’s treatment of such effects is superficial at best and often inaccurate. This alone renders the DEIS legally infirm under NEPA.

Additionally, the other significant source of cumulative effects on the resources of the NPR-A is further oil and gas leasing and development activity, both in the immediate vicinity of the NPR-A, and elsewhere in the range of the species dependant on the NPR-A. The majority of the North Slope has either already been leased or is subject to a pending proposal for leasing. The species of the NPR-A and adjacent waters, such as the polar bear, ice seals, walruses and yellow-billed loon face the very real risk of having much of their currently suitable habitat rendered unsuitable within the very near (and clearly foreseeable) future.

While disturbance and development of the terrestrial habitat of the North Slope is of the greatest concern for species dependant on the region, BLM must also examine the significant threat posed to the species by offshore oil and gas development. Shell is in the final stages of receiving permits for its planned 2012 oil and gas exploration programs in the Beaufort and Chukchi seas. These areas are all either foraging habitat or wintering habitat for the eiders and loons that nest in the NPR-A. Because yellow-billed loons and eiders forage offshore of their breeding areas, as well as in their wintering areas, they are highly vulnerable to direct impacts from offshore development. Additionally, construction and operation of offshore facilities will result in increased helicopter activity over onshore breeding areas along with other land-based disturbances related to servicing offshore operations. These offshore activities will affect not only waterbirds, but also polar bears, walruses, and other marine mammals.

As shown in Figure 2, the NPR-A and adjacent lands and waters are home to variety of species, and all wildlife using the Alaskan Arctic will be negatively impacted by oil and gas development and climate change. Impacts from offshore drilling that would be enabled by infrastructure on the NPR-A, as stated repeatedly but *not* analyzed in the DEIS, will have major adverse impacts on marine mammals and on the marine ecosystem. Offshore oil and gas development will at the very least result in incidental harassment of marine mammals due to increased ship traffic, seismic testing, and operation of drill rigs. However, the impacts from offshore oil and gas leasing have a high potential to be much greater, in the event of a major blowout, gas leak, or oil spill. As climate warming contributes to more severe and more frequent storm events, offshore drilling and shipping may be subject to extreme storm events, resulting in the possibility of large oil spills. Impacts on wildlife in the NPR-A from offshore drilling must be analyzed.

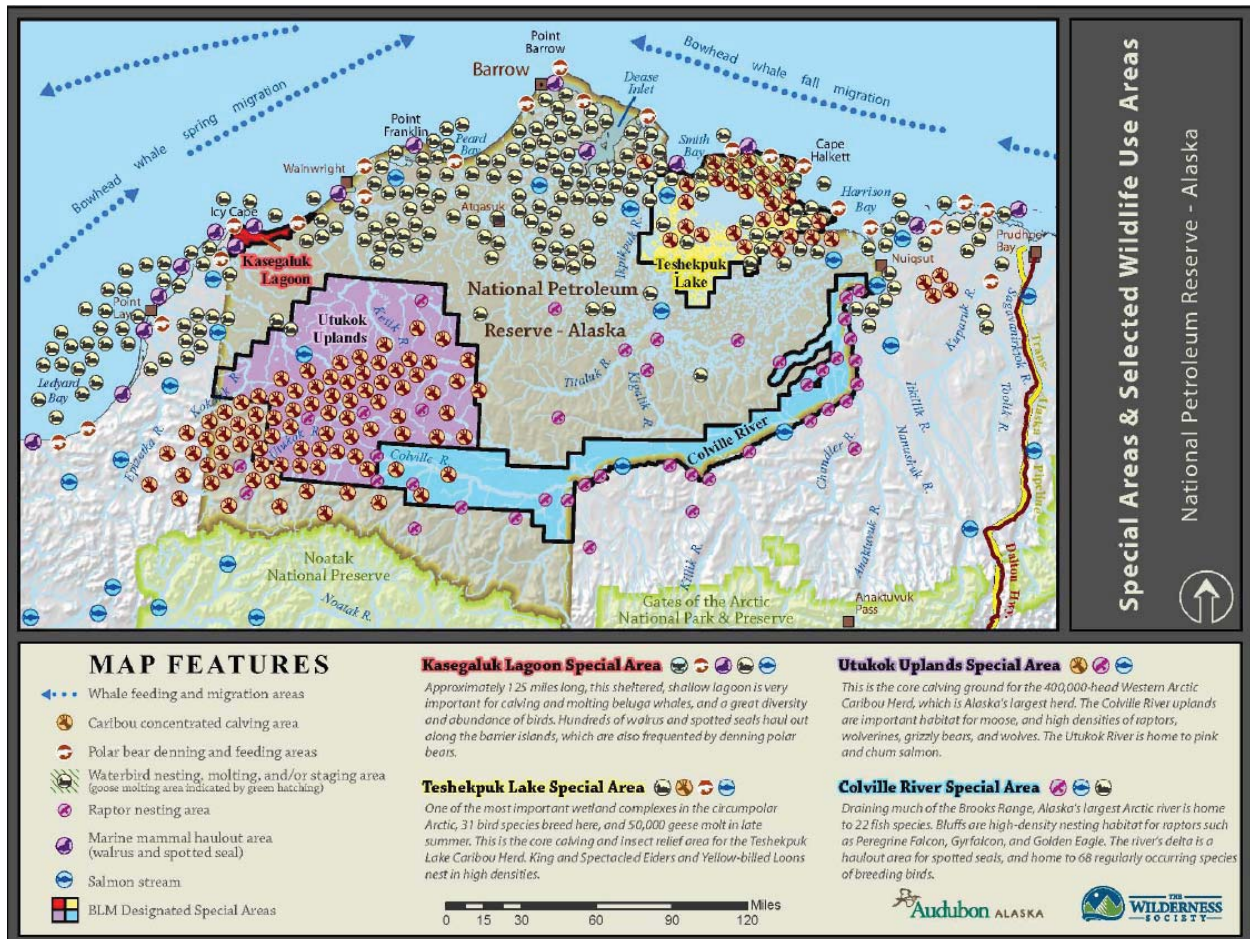


Figure 2. Wildlife species of the NPR-A area. Source: The Wilderness Society and Audubon, Alaska. Available at: <http://wilderness.org/content/obama-proposing-new-leasing-western-arctic-reserve>

Readily available information about the cumulative impacts of oil and gas activities both onshore and offshore in Alaska demonstrates significant cumulative effects on the resources of the NPR-A. However, these impacts are only superficially analyzed in the DEIS. This is not legally adequate. While less information is available about such activities and their impacts in Canada and Russia, what information that does exist indicates reason for concern and highly significant cumulative impacts.

In Canada, there are numerous proposals for oil and gas development in the Arctic as shown in Figure 3. The largest of these is the proposed Mackenzie Gas Project, which would likely result in wide-scale impacts to the Mackenzie River Delta and adjacent areas. Shell Canada Energy, Imperial Oil Resources and ExxonMobil Canada Properties received final approvals on March 2, 2012. This project will have major adverse impacts on wildlife and wildlife habitat, and also contribute a significant amount of GHGs. Yellow-billed loons are known to breed just to the east

of the Delta.⁴ The development of oil and gas resources in the Canadian Arctic would have comparable deleterious impacts on the yellow-billed loons and other sensitive waterbirds nesting in the region as similar development in the NPR-A and other areas of Alaska. Further detail on oil and gas projects in the Canadian Arctic is contained in the 2006 status review prepared by FWS for the polar bear (Schliebe et al 2006).

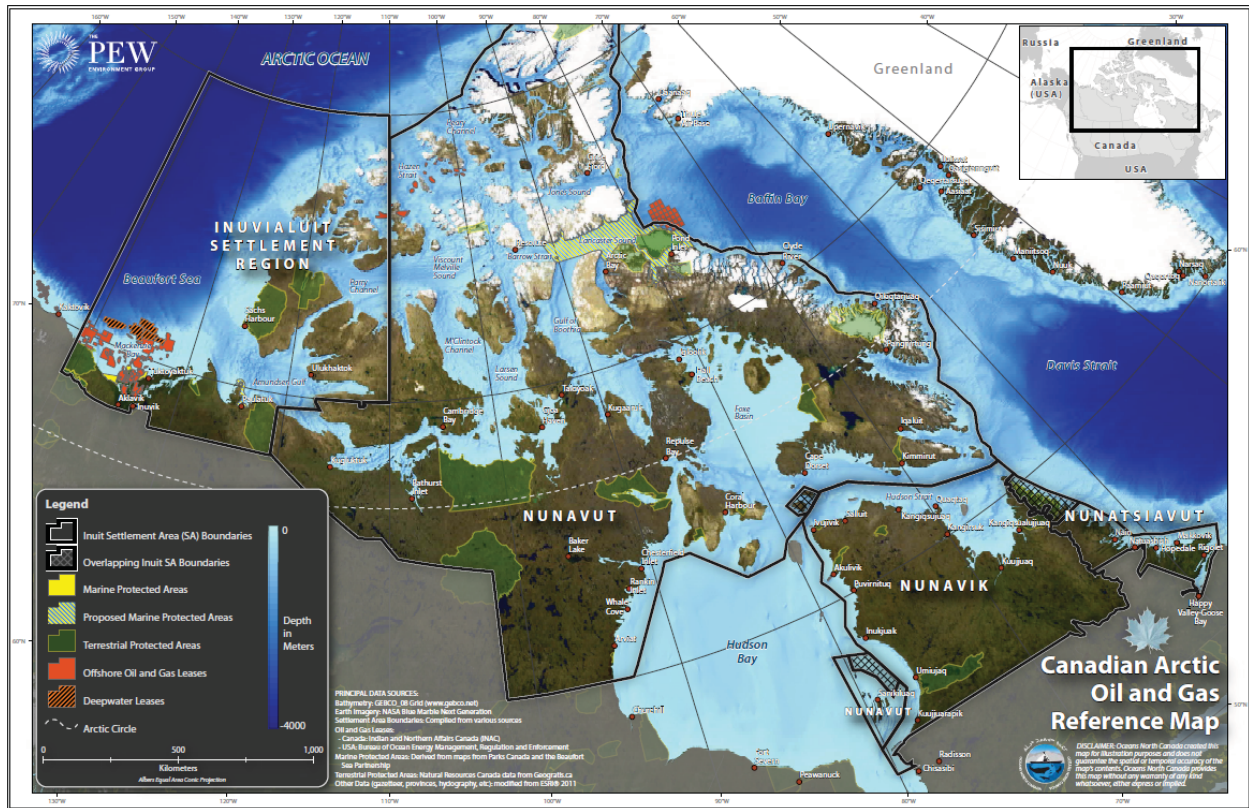


Figure 3. Oil and Gas Leases and proposed protected Areas in the Canadian Arctic. Source: Pew Environment Group. Available at: <http://oceansnorth.org/becoming-arctic-ready>

What information that is available regarding the impacts of oil and gas development in the Russian Arctic indicates likely disaster for the yellow-billed loon and other waterbirds. Both breeding areas for Russian nesting loons as well as marine wintering areas for Alaska nesting birds are subject to rapid industrial development in the Russian Arctic. Additional information on Russian Arctic oil development is contained in Schliebe et al (2006). The DEIS is devoid of discussion of such significant impacts.

An additional cumulative impact to the Arctic ecosystem of which the NPR-A is a part is the ongoing and projected increase in shipping in the Arctic. Such impacts are likely to be substantial, and information on them is readily available. *See, e.g.,* www.informaglobalevents.com/event/arcticshippingnorthamerica. Yet these foreseeable and substantial impacts are not discussed in the DEIS.

⁴ For the official Canadian government description of planned oil and gas activities in the Canadian Arctic see <http://www.aadnc-aandc.gc.ca/eng/1310583842498>. For an analysis of the cumulative impacts of these proposed activities, see <http://pubs.aina.ucalgary.ca/misc/74859.pdf>.

Another major cumulative impact not mentioned in the DEIS is the unusual mortality events for marine mammals, as discussed in detail in the marine mammal section.

Finally, many of the species dependant on the NPR-A, such as the yellow-billed loon, Pacific brant, and buff-breasted sandpiper, migrate from breeding or molting grounds in the NPR-A to wintering areas in North and South America and elsewhere. Many of these wintering grounds are undergoing rapid transformation, resulting in substantial cumulative effects on these species. There is little to no discussion of such impacts in the DEIS.

G. Conclusion

In sum, to further the goals of NEPA and provide full consideration and disclosure of the environmental consequences of the management of the NPR-A, BLM must take into account in its FEIS the direct, indirect and cumulative impacts of its proposal, including global warming impacts. BLM must analyze the greenhouse gas emission from the use of the fossil fuels produced from the lease sales that would be allowed under the various alternatives. Additionally, BLM must analyze the potential impacts on the wildlife and the environment in the lease sale area from further global warming. BLM should consider these impacts from its actions, all cumulative impacts affecting the species and communities in the Alaskan Arctic, and adjacent areas directly and indirectly affected by the lease sales. BLM must also take steps to avoid and mitigate all of these adverse affects of the lease sales. Unfortunately, this DEIS accomplishes none of these objectives. We believe that the only conclusion compatible with NEPA, the ESA, and common sense is to forgo the proposed lease sales entirely, withdraw the DEIS, and proceed with a new NEPA process that includes alternatives to increase protection of the NPR-A and the Arctic and reduce greenhouse gas emissions. Thank you for the opportunity to provide these comments.

Sincerely,



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THE POTENTIAL GREENHOUSE GAS EMISSIONS OF U.S. FEDERAL FOSSIL FUELS



The Potential Greenhouse Gas Emissions of U.S. Federal Fossil Fuels

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The Potential Greenhouse Gas Emissions of U.S. Federal Fossil Fuels

I. Executive Summary

This report was undertaken to facilitate a better understanding of the consequences of future federal fossil fuel leasing and extraction in the context of domestic and global efforts to avoid dangerous climate change. We estimate the potential greenhouse gas (GHG) emissions from developing the remaining fossil fuels in the United States (U.S.), including the emissions from developing publicly owned, unleased federal fossil fuels that constitute 450 billion tons of CO₂e.

We report the volume of these fossil fuels, including that of leased and unleased federal fossil fuels located beneath federal and non-federal lands and the outer continental shelf. These resource appraisals are used to estimate the life-cycle GHG emissions associated with developing crude oil, coal, natural gas, tar sands, and oil shale—including emissions from extraction, processing, transportation, and combustion or other end uses. We express potential emissions in gigatons (“Gt”) (one gigaton equals one billion tons) of carbon dioxide equivalent (CO₂e), and discuss them below in the context of global emissions limits and nation-specific emissions quotas.

Major findings are that:

- The potential GHG emissions of federal fossil fuels (leased and unleased) are 349 to 492 Gt CO₂e, representing 46% to 50% of potential emissions from all remaining U.S. fossil fuels. Federal fossil fuels that have not yet been leased for development contain up to 450 Gt CO₂e.
- Unleased federal fossil fuels comprise 91% of the potential GHG emissions of all federal fossil fuels. The potential GHG emissions of unleased federal fossil fuel resources range from 319-450 Gt CO₂e. Leased federal fossil fuels represent from 30-43 Gt CO₂e.
- The potential emissions from unleased federal fossil fuels are incompatible with any U.S. share of global carbon limits that would keep emissions below scientifically advised levels.

Potential GHG Emissions from U.S. Federal Fossil Fuels

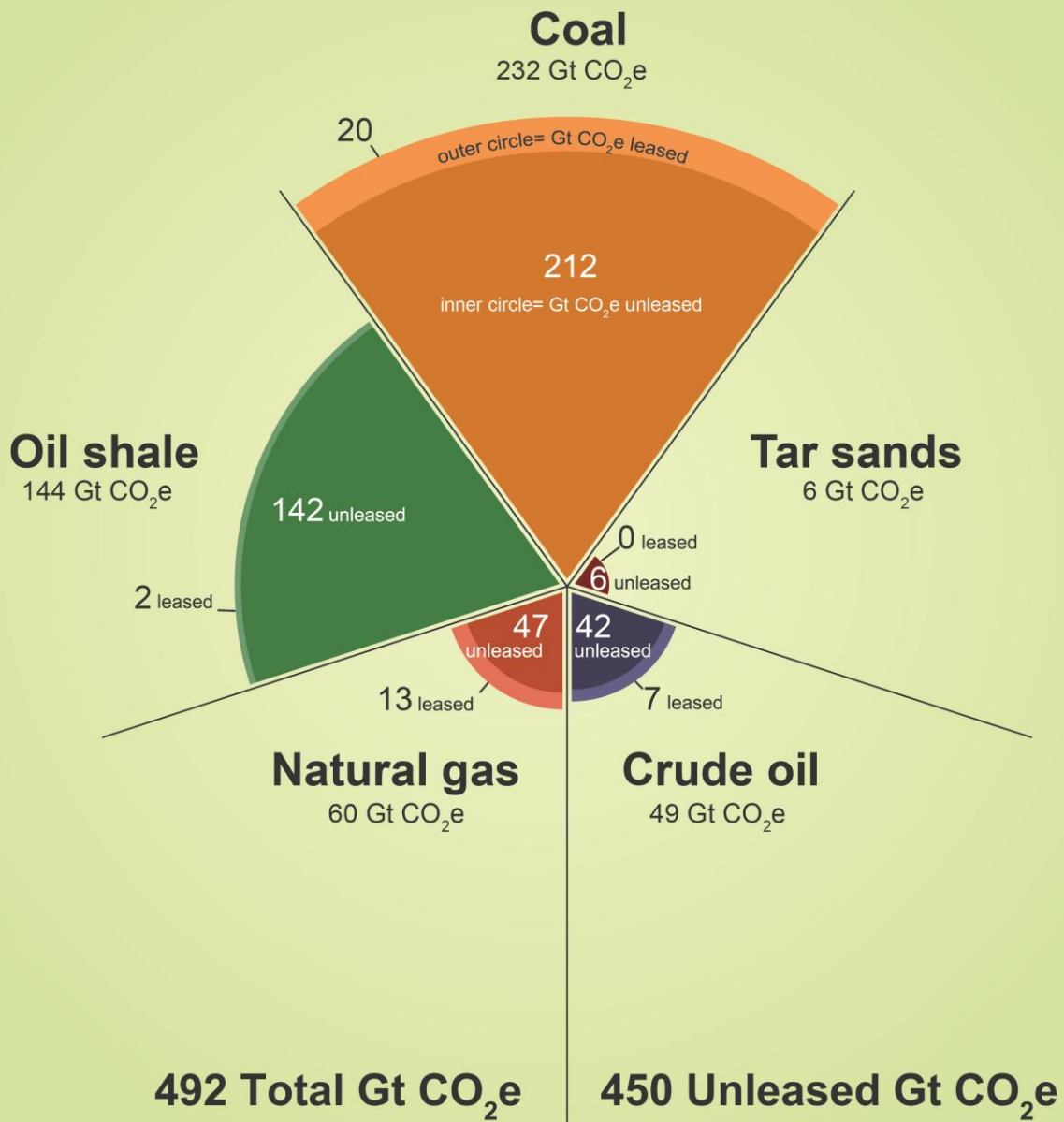


Figure 1. Potential emissions of leased and unleased federal fossil fuels.

Our results indicate that a cessation of new federal fossil fuel leasing could keep up to 450 Gt CO₂e from the global pool of potential future GHG emissions. (Figure 1.) This is equivalent to 13 times global carbon emissions in 2014 or annual emissions from

118,000 coal-fired power plants. This has a significant potential for GHG emissions savings that is best understood in the context of global limits and national emissions quotas.

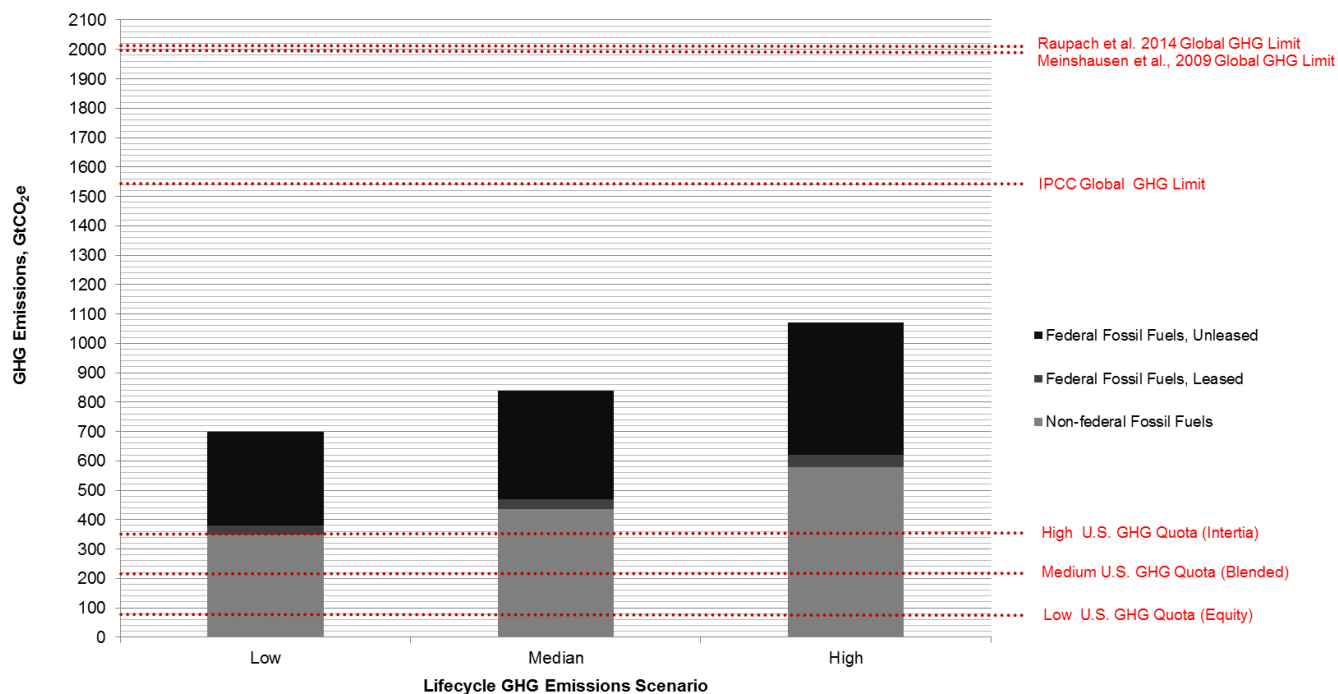
Carbon emission quotas are the maximum amount of greenhouse gases humanity can emit while still preserving a given chance of limiting average global temperature rise to a level that will not be catastrophic. The Intergovernmental Panel on Climate Change has recommended efforts to ensure that temperature increases remain below 2°C by century's end, a level at which dramatic adverse climate impacts are still expected to occur. Nation-specific emissions quotas are the amount of greenhouse gas emissions that an individual country can emitⁱ.

Studies that have apportioned global emissions quotas among the world's countries indicate that the U.S. share of the global emissions is limited, with varying estimates depending on the equity principles used. For example, Raupach et al. (2014) estimated three U.S. GHG emissions quota scenarios of 85Gt CO₂e, 220 Gt CO₂e, and 356 Gt CO₂e necessary to maintain only a 50 percent likelihood of avoiding 2°C (3.6°F) warming by century's end, depending on the equity assumptions used within a total global emissions limit. These represent a range of approximate equity assumptions for apportioning emissions quotas.ⁱⁱ Under any of those quotas, emissions from new federal fossil fuel leasing are precluded after factoring in the emissions of developing non-federal and already leased fossil fuels. (Figure 2.)

ⁱ In this report we use the terms "share of limit" and "quota" interchangeably and define them in the context of scientifically advised emission limitations exclusive of sequestration. In some cases, studies and reports also use the term "budget". Much of the literature, coverage, and usage of these issues utilize the terms in this way; however, in some cases carbon "budgets" are defined more broadly to encompass sources, fluxes and sinks; while "quotas" are defined more narrowly to encompass only limits on future emissions necessary to meet a certain average global temperature target. We feel this usage is appropriate here since "carbon budgets" generally refer to the total cumulative mass of carbon emissions allowable over time, while this report describes the total cumulative mass of carbon under federal and non-federal lands which may or may not be emitted into the atmosphere over time.

ⁱⁱ We use Raupach et al. (2014) U.S. emissions quotas for illustration purposes only; this report and its authors do not endorse equity assumptions made therein. We use the ratio of 1.39 CO₂e/CO₂ reported in Meinshausen et al. (2009) to convert the values reported in Raupach et al. (2014) from CO₂ to CO₂e. We also exclude Raupach et al.'s "future committed emissions" from their published -30, 67 and 165 GtCO₂ U.S. quotas to isolate the quotas from assumptions about "future committed emissions." Notably, under Raupach et al.'s "equity" scenario, "future committed emissions" already exceed the remaining U.S. quota; Raupach et al. thus report a remaining "equity" scenario quota of -30 Gt CO₂.

Potential Lifecycle GHG Emissions of Federal and Non-federal Fossil Fuels, and Global GHG Limits and U.S. GHG Quotas to Maintain 50% Likelihood of Keeping Warming Below 2°C (3.6°F) *



* GHG limits and quotas published in CO₂ are displayed in CO₂e using the ratio of 1.39 CO₂e/CO₂ reported in Meinshausen et al. (2009). U.S. GHG quotas from Raupach et al. 2014. Limits and quotas are lower for maintaining higher likelihood of limiting warming to below 2°C and/or keeping warming below a lower temperature, like 1.5°C.

Figure 2. Global carbon limits, U.S. emissions quotas and potential emissions from federal and non-federal fossil fuels.

II. Introduction

The Intergovernmental Panel on Climate Change (IPCC) recently warned that humanity must adhere to a strict “carbon limit” in order to preserve a likely chance of holding average global warming to less than 2°C (3.6°F) by the end of the century—a level of warming that still will cause extreme disruption to both human communities and natural ecosystems.¹ According to the IPCC, all future global emissions must be limited to about 1,000 gigatons (“Gt,” one gigaton equals one billion tons) of carbon dioxide (CO₂) to have a likely (>66%) chance of staying below 2°C.² The International Energy Agency has projected that the entire remaining 1,000 Gt CO₂ (1,390 Gt CO₂eⁱⁱⁱ) carbon budget will be consumed by 2040 on the current emissions course.³

Carbon quotas are the maximum amount of greenhouse gases humanity can emit while still preserving a given chance of limiting average global temperature rise to a level that will not be catastrophic. The Intergovernmental Panel on Climate Change has used a carbon limit to keep temperature increases below 2°C by century’s end, a level at which dramatic adverse climate impacts are still expected to occur. Nation-specific emissions

quotas are the amount of greenhouse gas emissions that an individual country can emit.^{iv}

Studies that have apportioned global emissions quotas among the world's countries indicate that the U.S. share of the global emissions is limited, with varying estimates depending on the equity principles used. For example, Raupach et al. (2014) estimated three U.S. GHG emissions quota scenarios of 85 Gt CO₂e, 220 Gt CO₂e, and 356 Gt CO₂e necessary to maintain only a 50 percent likelihood of avoiding 2°C (3.6°F) warming by century's end, depending on the equity assumptions used within a total global emissions limit. These represent a range of approximate equity assumptions for apportioning emissions quotas.^v Under any of those quotas, emissions from new federal fossil fuel leasing are precluded given the potential emissions from already-leased federal fossil fuels and those of non-federal fossil fuels.

Raupach et al.'s three scenarios are based on:

- High (inertia): Favors “grandfathering” of emissions, favoring a distribution of quota emissions to nations or regions with higher historical emissions.
- Medium (blended): Blends “inertia” and “equity” emissions.
- Low (equity): Favors a distribution of quota emissions based on population distribution, or emissions per capita, in regions or nations.

In 2013, the U.S. emitted 6.67 Gt CO₂e,⁴ the majority (85%) coming from the burning of fossil fuels,⁵ and accounting for 15% of global emissions.⁶ A 2015 analysis by an international team of climate experts⁷ suggests that for a likely probability of limiting warming to 2°C, the U.S. must reduce its GHG emissions in 2025 by 68 to 106% below 1990 levels, with the range of reductions depending on the sharing principles used.⁸ Accordingly, U.S. GHG annual emissions in 2025 would have to range between 2 Gt CO₂e (i.e., 68% below 1990) and negative emissions of -0.4 Gt CO₂e (i.e., 106% below 1990), significantly below current emissions of ~6.7 Gt CO₂e. Where negative emissions are required, the remaining carbon budget has been exhausted.

Under the current U.S. “all of the above” energy policy, federal agencies lease lands to private companies to extract and sell federal fossil fuel resources, including submerged offshore lands of the outer continental shelf. Leases initially last ten years, or twenty

^{iv} Emissions quotas are one among many mechanisms for determining equity and fairness in international climate negotiations. Equity principles generally include assumptions about different countries' historical responsibility for climate emissions, their ability to mitigate emissions, as well as measures of developed country support for emissions mitigation and adaptation in developing countries. While we are only using emissions quotas to illustrate the size of U.S. fossil fuel resources, we recognize that emissions quotas cannot be discussed independently from climate finance commitments.

^v We use Raupach et al. (2014) U.S. emissions quotas for illustration purposes only; this report and its authors do not endorse equity assumptions made therein. We use the ratio of 1.39 CO₂e/CO₂ reported in Meinshausen et al. (2009) to convert the values reported in Raupach et al. (2014) from CO₂ to CO₂e. We also exclude Raupach et al.'s “future committed emissions” from their published -30, 67 and 165 GtCO₂ U.S. quotas to isolate the quotas from assumptions about “future committed emissions.” Notably, under Raupach et al.'s “equity” scenario, “future committed emissions” already exceed the remaining U.S. quota; Raupach et al. thus report a remaining “equity” scenario quota of -30 Gt CO₂.

years in the case of coal, and may continue indefinitely once successful mineral extraction begins. Though these leases collectively span many tens of millions of acres, federal agencies do not currently track or report the nation-wide cumulative GHG emissions that result from federal leasing of fossil fuel reserves. There have been studies that account for past emissions from federal fossil fuel leasing. For example, a 2014 Stratus Consulting report completed for The Wilderness Society, titled *Greenhouse Gas Emissions from Fossil Energy Extracted from Federal Lands and Waters: An Update*, estimated that, in calendar year 2012, emissions from federal fossil fuel production were 1.344 Gt CO₂e, or 21% of all U.S. GHG emissions that year.⁹ A 2015 analysis completed by the Climate Accountability Institute for the Center for Biological Diversity and Friends of the Earth estimated that federal fossil fuel production accounted for 1.278 Gt CO₂e of emissions in 2012, and during the past decade contributed approximately 25% of all U.S. GHG emissions associated with fossil fuel consumption, which represents around 3-4% of global fossil fuel emissions during that time.¹⁰ Yet, there has been no assessment of the potential GHG savings from sequestering remaining unleased federal fossil fuels.

This report models the total amounts and potential GHG emissions associated with the remaining federal and non-federal fossil fuels in the U.S. We compiled federal and industry inventories of total fossil fuel resources and, using standard life-cycle assessment guidelines, we calculated life-cycle GHG emissions associated with all phases of developing federal and non-federal coal, crude oil, natural gas, tar sands, and oil shale resources. We evaluated low, median, and high emission scenarios for each of the fossil fuels studied to account for some of the uncertainties associated with producing some fossil fuels.

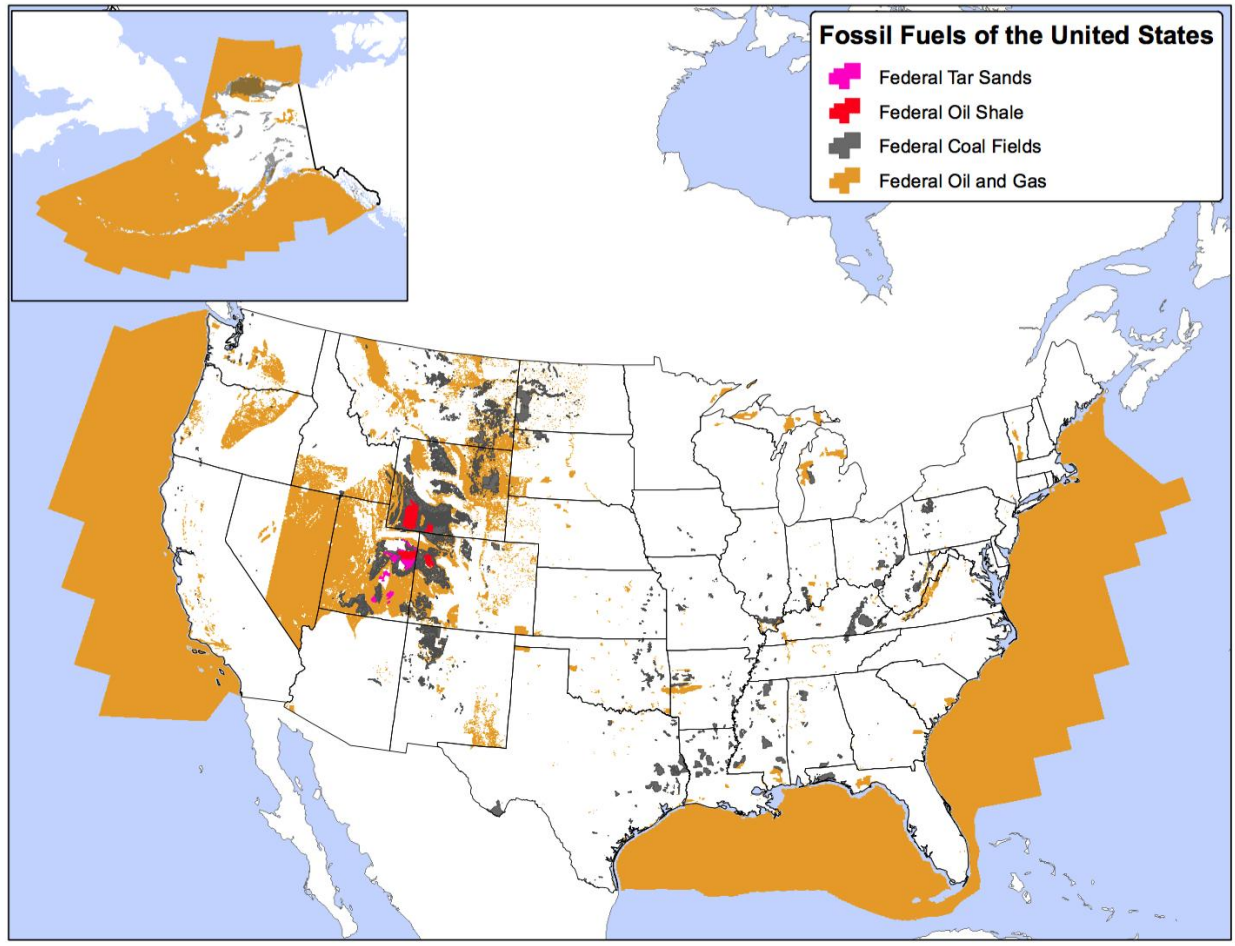


Figure 3. Map of U.S. Federal Fossil Fuels.

Our analysis focuses on the potential GHG emissions from the remaining unleased federal fossil fuel resources in the U.S. Keeping these fossil fuels in the ground would contribute significantly to global efforts to prevent combustion emissions from remaining fossil fuel resources. For the purposes of this report, unleased federal fossil fuels are those federal fossil fuel resources that are not currently leased to private companies. They include unleased recoverable federal coal reserves, federal oil shale, federal crude oil, federal natural gas, and federal tar sands. Unleased federal fossil fuels include resources that are available for leasing under current federal policy and that could become available for leasing under future federal policy.¹¹

Key terms

All U.S. fossil fuels include all federal and non-federal recoverable coal reserves, oil shale, crude oil, natural gas and tar sands (onshore and offshore).

Federal fossil fuels are federally controlled, publicly owned fossil fuel resources. Federal fossil fuels are located beneath lands under federal and other ownerships, where the federal government owns subsurface mineral rights. They are also located “offshore,” beneath submerged public lands of the outer continental shelf. Federal fossil fuels include recoverable federal coal reserves, federal oil shale, federal crude oil, federal natural gas and unleased federal tar sands.

Leased federal fossil fuels are federal fossil fuel resources, including proved reserves and resources under non-producing leased land, as classified by the Bureau of Ocean Energy Management (BOEM) and Bureau of Land Management (BLM), which are currently leased to private companies. These include leased federal recoverable coal reserves, leased federal oil shale, leased federal crude oil, leased federal natural gas and leased federal tar sands.

Non-federal fossil fuels are fossil fuel resources calculated by subtracting federal fossil fuel amounts from total technically recoverable oil resources, total technically recoverable natural gas resources, and total recoverable coal reserves in the United States as provided by EIA 2012a.

Unleased federal fossil fuels are federal fossil fuel resources that are not leased to private companies. These include unleased recoverable federal coal reserves, unleased federal oil shale, unleased federal crude oil, unleased federal natural gas, and unleased federal tar sands.

Recoverable coal reserves are the portion of the Demonstrated Reserve Base that the Energy Information Agency estimates may be available or accessible for mining.

Federal recoverable coal reserves are the federally controlled portion of recoverable coal reserves.

Crude oil is onshore and offshore technically recoverable federal and non-federal crude oil resources. **Federal crude oil** is federally controlled crude oil.

Natural gas is onshore and offshore technically recoverable federal and non-federal natural gas resources. **Federal natural gas** is federally controlled natural gas.

Federal oil shale is federally controlled oil shale that is geologically prospective according to deposit grade and thickness criteria in the Bureau of Land Management’s 2012 Final Oil Shale and Tar Sands Programmatic Environmental Impact Statement (PEIS) and Record of Decision (ROD). Geologically prospective oil shale resources in

Colorado and Utah are deposits that yield 25 gallons of oil per ton of rock (gal/ton) or more and are 25 feet thick or greater. In Wyoming geologically prospective resources are deposits that yield 15 gal/ton or more and are 15 feet thick or greater.

Tar sands are estimated in-place tar sands resources. **Federal tar sands** are federally controlled tar sands.

Proved or proven reserves are estimated volumes of hydrocarbon resources that analysis of geologic and engineering data demonstrates with reasonable certainty are recoverable under existing economic and operating conditions. Reserve estimates change from year to year as new discoveries are made, existing fields are more thoroughly appraised, existing reserves are produced, and prices and technologies change. Because establishing proved reserves requires drilling, which first requires leasing, proved federal fossil fuel reserves are necessarily leased, and unleased federal fossil fuels necessarily are not proved.

Technically recoverable refers to oil and gas resources that are unleased but producible using current technology without reference to their economic viability.

In-place resource is the entire fossil fuel resource in a geologic formation regardless of its recoverability or economic viability.

II. Research Methodology

Greenhouse gas (GHG) emissions associated with developing fossil fuel resources were estimated by (a) quantifying the volume and energy value of federal and non-federal fossil fuels, (b) determining the end uses and proportions of different end-use products made from fossil fuels, and (c) estimating the total GHG emissions from developing these resources and processing them into end-use products, by multiplying the total volume energy value of fossil fuel products by their life-cycle emissions factors.

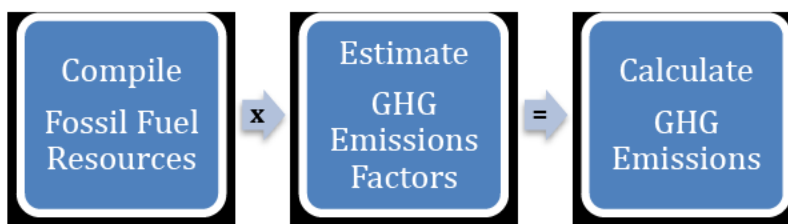


Figure 4. Research methodology

A) Quantifying Fossil Fuel Resources Volumes and Energy Values

Federal and non-federal fossil fuel quantities were obtained from federal estimates by the Bureau of Land Management (BLM), Energy Information Agency (EIA), U.S. Geological Survey (USGS), Office of Natural Resource Revenue (ONRR), the Department of Interior (DOI), and Congressional Research Service (CRS). Federal agencies similarly report the technically recoverable resources for crude oil and natural gas based on a consistent definition. For coal, agencies estimate recoverable coal by assessing the accessibility and recovery rates for the demonstrated coal base. For oil shale and tar sands the quantity is based on the resource available and in-place resources, which do not attempt to characterize the resource based on the likelihood of development. Unleased volumes of federal fossil fuels were calculated by subtracting leased volumes from the sum of technically recoverable quantities.

Quantities of federal and non-federal crude oil, natural gas, coal, oil shale and tar sands were summed and converted into values that represent each fossil fuel's energy content, called its primary energy value. This was done by multiplying the fossil fuel volumes by a heating value factor that represents the resource's energy content. Lower Heating Values were used for all fuels except coal, where the Higher Heating Value was taken as per convention for solid fuels in the U.S. Heating values for each resource were taken from Oak Ridge National Laboratory (ORNL), and can be found in the *Fossil Fuel Volumes to Primary Energy Conversions* section in Appendix I.

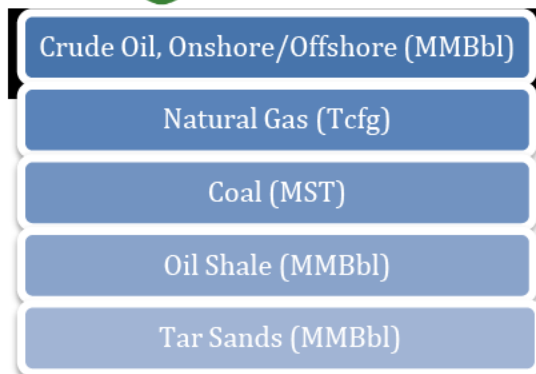


Figure 5. Fossil fuels analyzed

Figure 3 above shows the five fossil fuel types analyzed as they are broadly defined by federal agencies: Oil (onshore and offshore), gas (onshore and offshore) coal, oil shale and tar sands. The hydrocarbons included within federal oil and gas definitions are reported in Table 1 below.

Fossil fuel type	Crude oil	Condensate	Natural gas liquids	Dry natural gas	Gas, wet after lease separation	Non-associated gas, wet after separation	Natural gas associated-dissolved, wet after lease separation	Coalbed methane
Onshore oil	x	X	x					
Offshore oil	x	X	x					
Onshore gas				x	x	x	x	x
Offshore gas				x	x	x	x	x

Table 1. Hydrocarbons in the categories of crude oil and natural gas

B) Determining the End-Use Products Made from Fossil Fuels

Each fossil fuel resource was converted to a value that represents its energy content and divided into amounts used as inputs for different end-use products. We allocated the proportions of each resource into end-use products as follows:

- The energy in crude oil resources was proportionally divided into: finished motor gasoline, distillate fuel oil, kerosene, liquefied petroleum gases (LPG), petroleum coke, still gas and residual fuel oil.
- The energy in natural gas resources was split into residential, commercial, industrial, electric power and transportation end-use sectors.
- The energy in coal reserves was divided to electric power, coke and other industrial uses.
- Energy in tar sands and oil shale was assumed to be processed into end-use products analogous to crude oil.

These proportions make it possible to apply end-use product specific life-cycle emissions factors. For each product we determined the amount that could be yielded from the initial energy after processing, using a “primary energy factor” derived from

figures and conversion factors from sources in the literature, such as those developed at the National Renewable Energy Laboratory (NREL).



Figure 6. Steps to determine fossil fuel amounts and apply specific energy and emissions factors

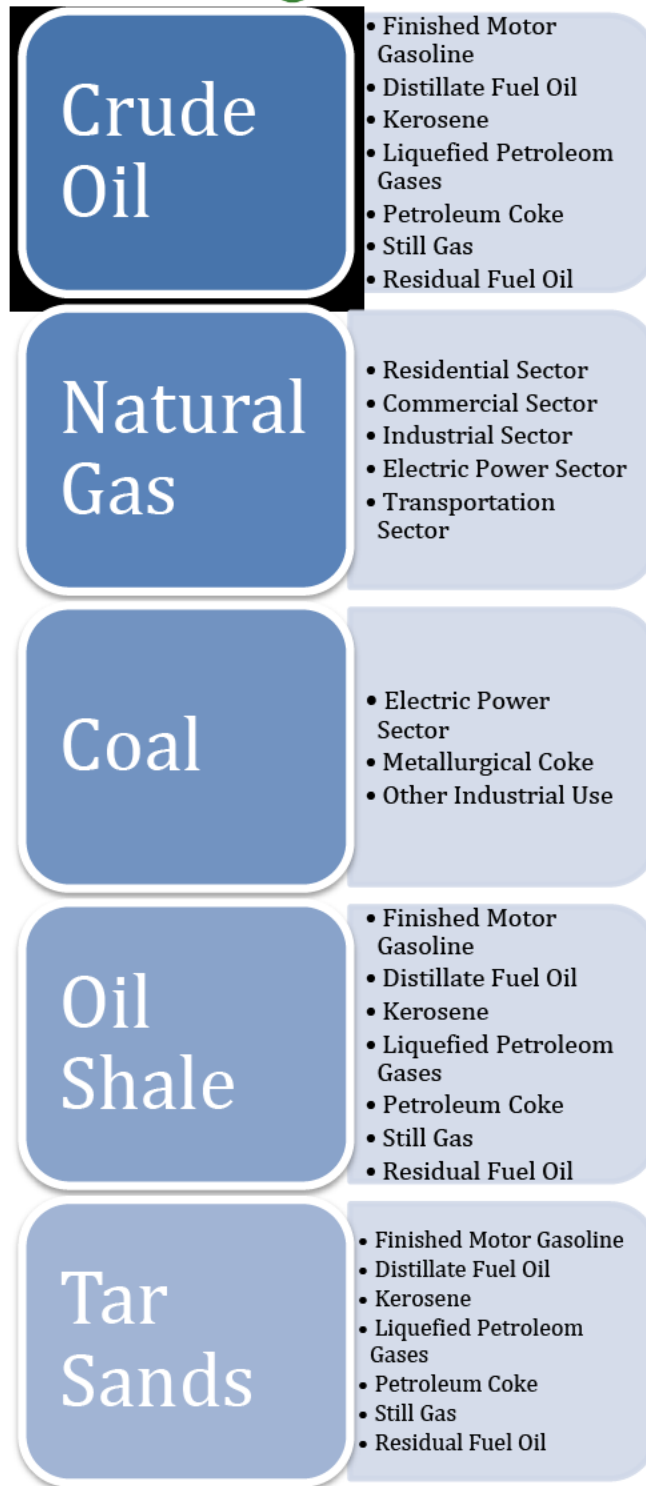


Figure 7. Fossil fuel resources and end-use products and sectors

C) Multiplying the Quantity of Fossil Fuel Energy by GHG Emissions Factors

The total energy value of each fossil fuel product end use was multiplied by product-specific life-cycle emissions factors to estimate the total GHG emissions. Life-cycle GHG emissions factors represent the amount of GHGs released when burning one unit 15

of energy. In peer-reviewed life-cycle assessments of fossil fuels, there are uncertainties associated with the GHG emissions of some fuels. For example, the life-cycle emissions associated with land use change resulting from coal extraction can be a source of uncertainty given differing amounts of methane leakage. To account for these uncertainties, the analysis used three scenarios for each fossil fuel corresponding to high, median, low GHG emissions factors reported in the scientific literature. The low GHG emissions factor scenario was chosen as the base case, and the high emissions factor scenario is the worst case scenario (most inefficient use of fossil fuels).

Each scenario represents different magnitudes (high, median and low) of global warming pollution associated with different fossil fuels. The high emissions scenario represents the worst-case greenhouse gas pollution scenario. Where available we used emissions factors from research by the U.S. national energy laboratories including Argonne National Laboratories' GREET tool and several meta-analyses from NREL that produced harmonized emissions-factors based on extensive prior research. Although emissions factors can vary following changes in any of the parameters in the underlying study, Table 2 in Appendix II highlights key parameters that significantly affect the magnitude of the emission factor and consequently influence whether it is characterized as low, median or high.

Where necessary, the following end-use product specific adjustments were made to improve the accuracy of life-cycle emissions factors:

- A carbon storage factor was determined for the following end-use products: metallurgical coke from coal, distillate fuel, liquefied petroleum gases (LPGs), petroleum coke from crude oil, and still gas.¹² This is to account for a proportion of carbon in the fossil fuel resource that is stored in the end product and not combusted or otherwise emitted. For example, some of the carbon in petroleum coke remains in products such as urea and silicon carbide, and the carbon storage factor reflects this.
- A shale-play weighting factor was applied to calculate emissions from natural gas to account for some studies that suggest that there may be higher amounts of methane released with natural gas extracted from shale versus conventional resources.¹³
- These calculations were summed to present results in 100-year Global Warming Potentials, represented as gigatons CO₂ equivalent (Gt CO₂e).

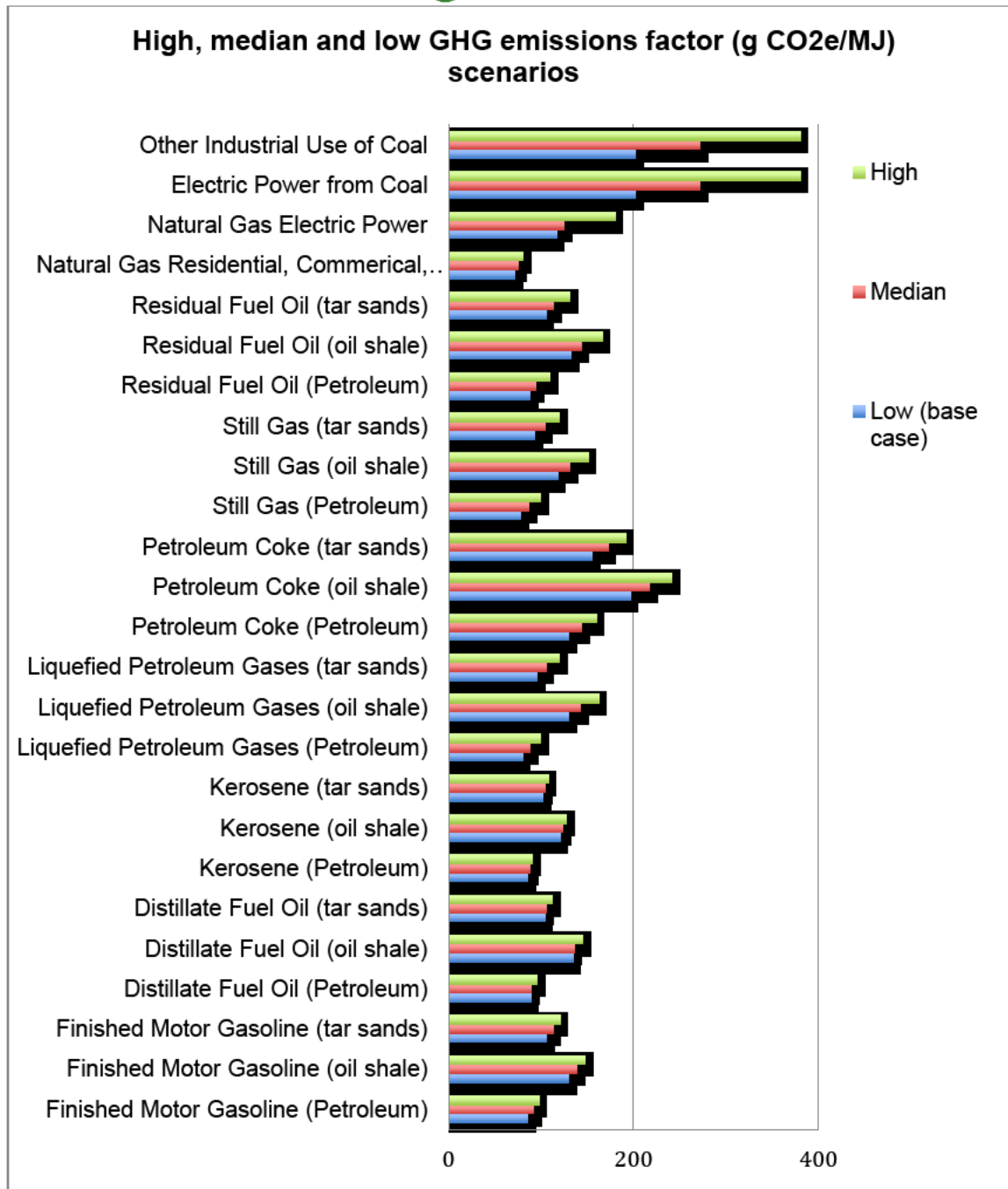


Figure 8. High, median and low (base case) GHG emissions factor scenarios.

Appendix I provides detailed methodologies for estimating fossil fuel volumes, converting fossil fuel volumes to primary energy, and calculating resource and end-use product-specific life-cycle emission factors. The full list of sources used to estimate fossil fuel amounts, primary energy factors, proportions of end-use products and sectors, carbon storage factors, and product specific life-cycle emissions factors are available in Appendix II.

III. Results

Our results indicate that:

1. The potential GHG emissions federal fossil fuels, leased and unleased, are 348.96 to 492.22 Gt CO₂e, representing 46% to 50% of potential emissions from all remaining U.S. fossil fuels; The potential GHG emissions of federal and non-federal fossil fuels are 697-1,070 Gt CO₂e. Unleased federal fossil fuels comprise 91% of the potential GHG emissions of all federal fossil fuels. The potential GHG emissions of unleased federal fossil fuel resources range from 319.00 to 449.53 Gt CO₂e. Leased federal fossil fuels represent from 29.96 to 42.69 Gt CO₂e;
2. Unleased federal recoverable coal accounts for 36% to 43% of the potential GHG emissions of all remaining federal fossil fuels, from 115.32 to 212.26 Gt CO₂e. Leased federal recoverable coal represents from 10.68 to 19.66 Gt CO₂e of potential emissions.
3. Unleased federal oil shale accounts for 29% to 35% of potential GHG emissions of all remaining federal fossil fuels, ranging from 123.17 to 142.07 Gt CO₂e. Leased federal oil shale accounts for 0.3% to 0.6% of potential GHG emissions of all remaining federal fossil fuels, representing 2 Gt CO₂e;
4. Unleased federal natural gas accounts for 10% to 11% of potential GHG emissions of all remaining federal fossil fuels, ranging from 37.86 to 47.26 Gt CO₂e, of which 36% are onshore and 64% are offshore. Leased federal gas represents 10.39 to 12.88 Gt CO₂e, 47% of which are onshore and 53% are offshore.
5. Unleased federal crude oil accounts for 9% to 12% of potential GHG emissions of all remaining federal fossil fuels, ranging from 37.03 to 42.19 Gt CO₂e, of which 28% are onshore and 72% are offshore. Potential emissions from leased federal crude oil represents from 6.95 to 7.92 Gt CO₂e, of which 33% are onshore and 67% are offshore.
6. Unleased federal tar sands accounts for 1% to 2% of potential GHG emissions of all remaining federal fossil fuels, ranging from 5.62 to 5.75 Gt CO₂e.

Federal versus non-federal fossil fuels

The potential GHG emissions from federal and non-federal fossil fuels were compared to contextualize the proportion that is federally owned. The results indicate that 34% of all remaining fossil fuels, based on the energy content of those fuels, are federally owned; these represent 348.96 to 492.22 Gt CO₂e of potential GHG emissions.

Table 2. GHG emissions, in GtCO₂e, from federal and non-federal fossil fuels

	Low	Median	High
Federal Leased	29.96	34.65	42.69
Federal Unleased	319.00	369.98	449.53
Non-federal	348.49	435.14	577.78
Total	697.45	839.77	1,070.00

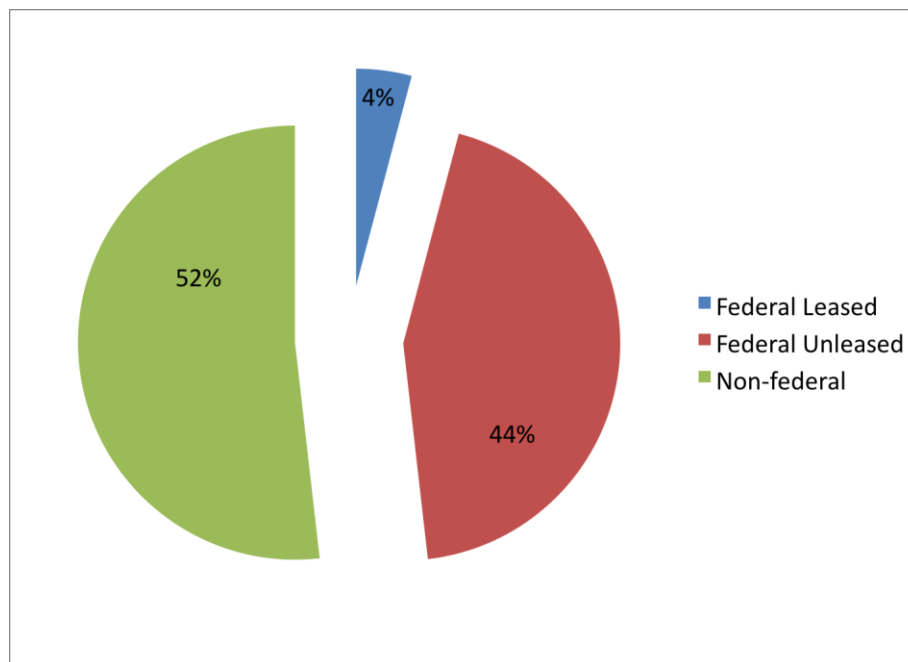


Figure 9. Relative potential emissions of federal and non-federal fossil fuels

Leased and unleased federal fossil fuels

Unleased and leased federal fossil fuels were examined to measure the GHG pollution from past leasing and to estimate the potential GHG emissions of unleased federal fossil fuels. Leased emissions are calculated using volumes of proved offshore and onshore oil and gas, volumes of offshore and onshore oil and gas underlying non-producing leased land, amounts of leased coal, and volumes of leased oil shale. The potential GHG emissions from unleased fossil fuel resources are approximately ten times greater than the emissions from currently leased federal fossil fuels.

Table 3. GHG Emissions (Gt CO₂e) from leased and unleased federal fossil fuels

	Low	Median	High
Federal Leased (Total)	29.96	34.65	42.69
<i>Crude Oil</i>	6.95	7.38	7.92
<i>Natural Gas</i>	10.39	11.01	12.88
<i>Coal</i>	10.68	14.19	19.66
<i>Oil Shale</i>	1.94	2.07	2.23
Federal Unleased (Total)	319.00	369.98	449.53
<i>Crude Oil</i>	37.03	39.32	42.19
<i>Natural Gas</i>	37.86	40.13	47.26

<i>Coal</i>	115.32	153.19	212.26
<i>Oil Shale</i>	123.17	131.67	142.07
<i>Tar Sands</i>	5.62	5.67	5.75

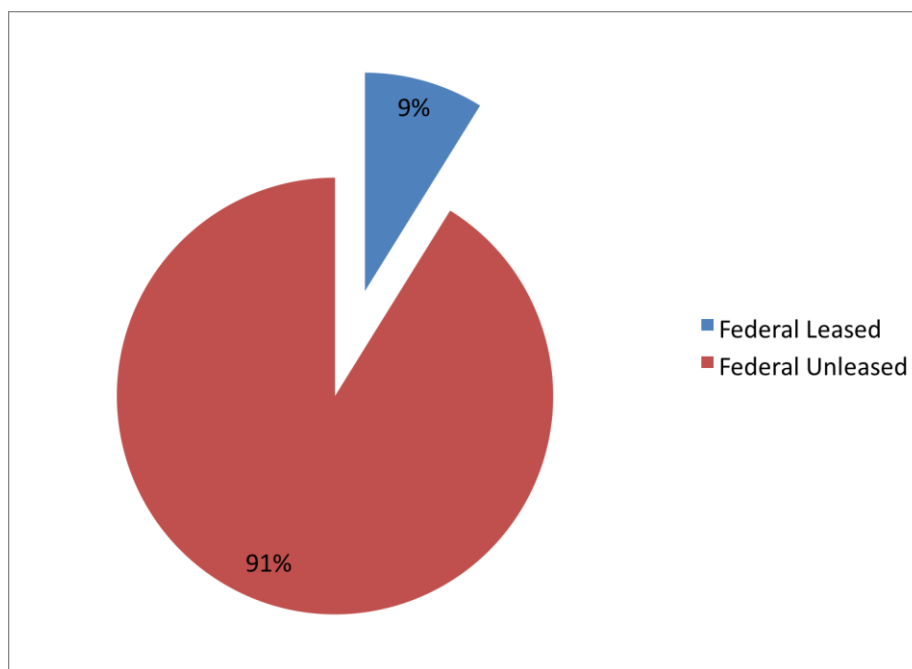


Figure 10. Low GHG emission factor scenario for leased and unleased federal fossil fuels

Unleased federal fossil fuels by resource type

The GHG emissions from unleased federal fossil fuels were evaluated by resource type. In a low emissions factor scenario, coal and oil shale are the biggest contributors of greenhouse gases. Under a high emissions factor scenario, coal is the biggest contributor of GHG pollution.

Table 4. GHG emissions (GtCO₂e) from unleased federal fossil fuels by resource type

	Low	Median	High
Federal Unleased			
<i>Crude Oil</i>	37.03	39.32	42.19
<i>Natural Gas</i>	37.86	40.13	47.26
<i>Coal</i>	115.32	153.19	212.26
<i>Oil Shale</i>	123.17	131.67	142.07
<i>Tar Sands</i>	5.62	5.67	5.75

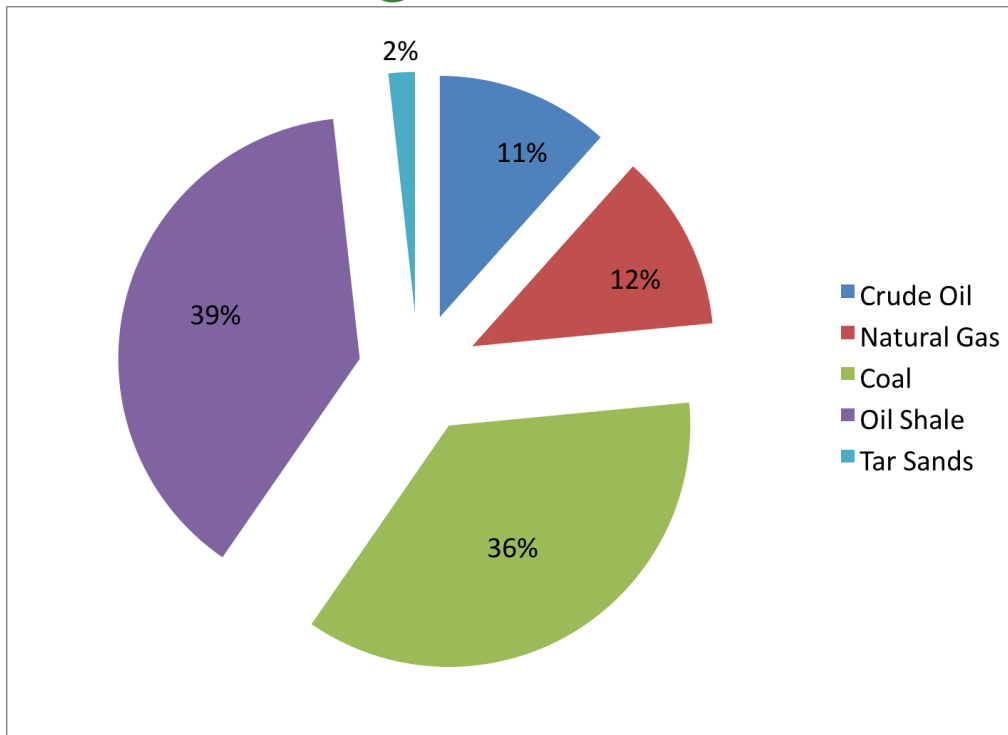


Figure 11. GHG emissions from unleased federal fossil fuels by resource type (low emissions scenario)

Coal

The potential greenhouse gas emissions from unleased recoverable coal reserves and leased recoverable coal reserves range from 115 to 212 Gt. This analysis used “recoverable coal reserves” when estimating the GHG emissions from coal, which is a common and conservative estimate of the portion of coal that could be extracted.

Table 5. GHG emissions (GtCO₂e) from federal coal

	Mass (MMST)	Low	Median	High
Federal Recoverable Coal Reserves				
<i>Unleased</i>	86,204	115.32	153.19	212.26
<i>Leased</i>	7,376	10.68	14.19	19.66

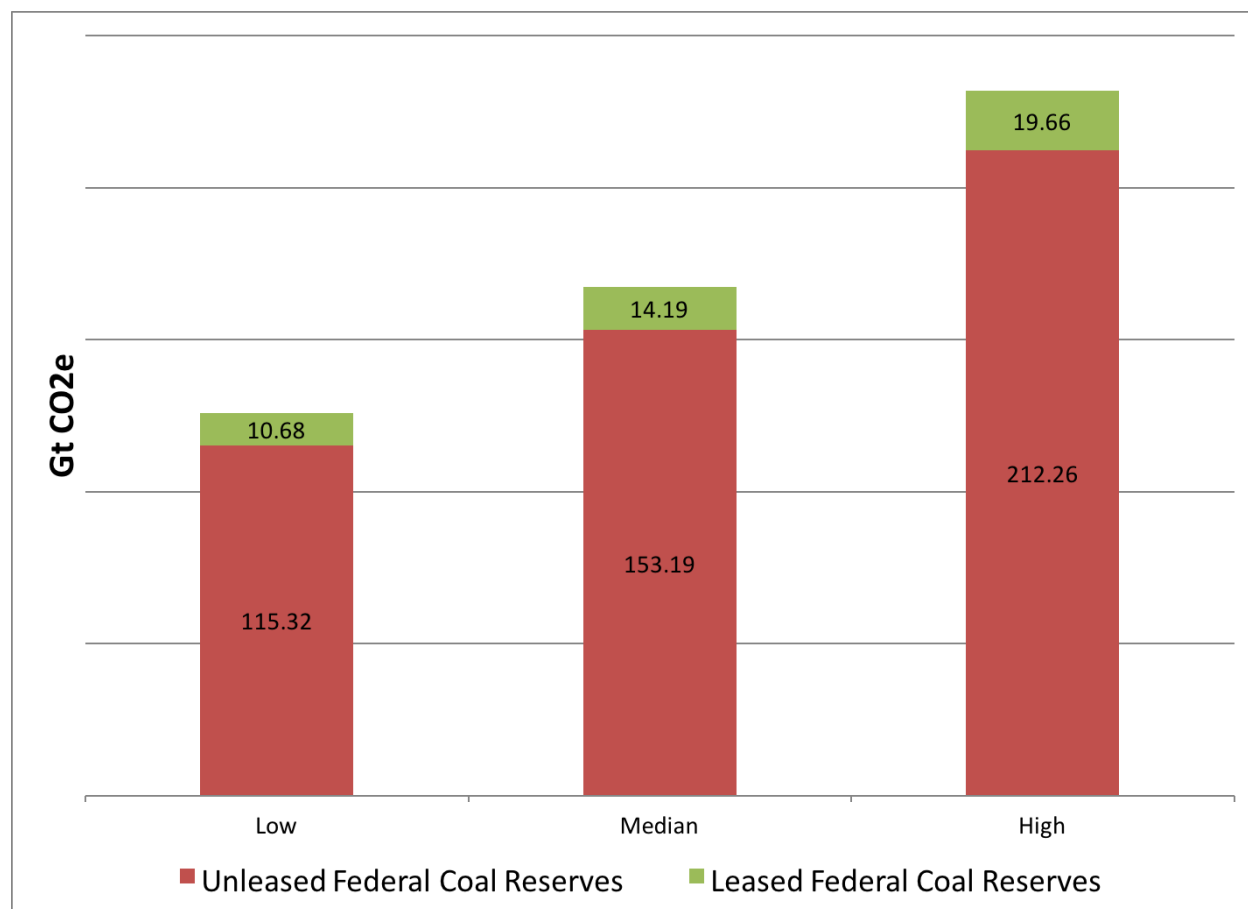


Figure 12. GHG emissions from federal coal under low, median and high emissions scenarios

Oil Shale

We analyzed the potential GHG emissions of federal oil shale and the portion of federal oil shale that is available for leasing under current federal policies. Since the life cycle GHG emissions of oil shale extraction and production are more than 50% greater than conventional crude oil per unit energy, oil shale resource results in the most potential GHG emissions per unit of energy delivered for all fossil fuels except coal. Federal oil shale includes only the resource that is geologically prospective according to deposit grade and thickness criteria in the Bureau of Land Management’s (BLM) 2012 Final Oil Shale and Tar Sands Programmatic EIS and Record of Decision. Geologically prospective oil shale resources in Colorado and Utah are deposits that yield 25 gallons of shale oil per ton of rock (gal/ton) or more and are 25 feet thick or greater. In Wyoming geologically prospective resources are deposits that yield 15 gal/ton or more and are 15 feet thick or greater. Our analysis assumes that geologically prospective federal oil shale resources that are not currently available for leasing can potentially become available for leasing in the future because they are under federal mineral rights.

Table 6. GHG emissions (GtCO₂e) from federal geologically prospective oil shale

	Volume (MMBbls)	Low	Median	High
Federal Oil Shale				
<i>Available for Lease Under PEIS and ROD & RD&D Leases</i>	75,606	24.65	26.35	28.44
<i>Total in Place Resource</i>	383,678	123.17	131.67	142.07

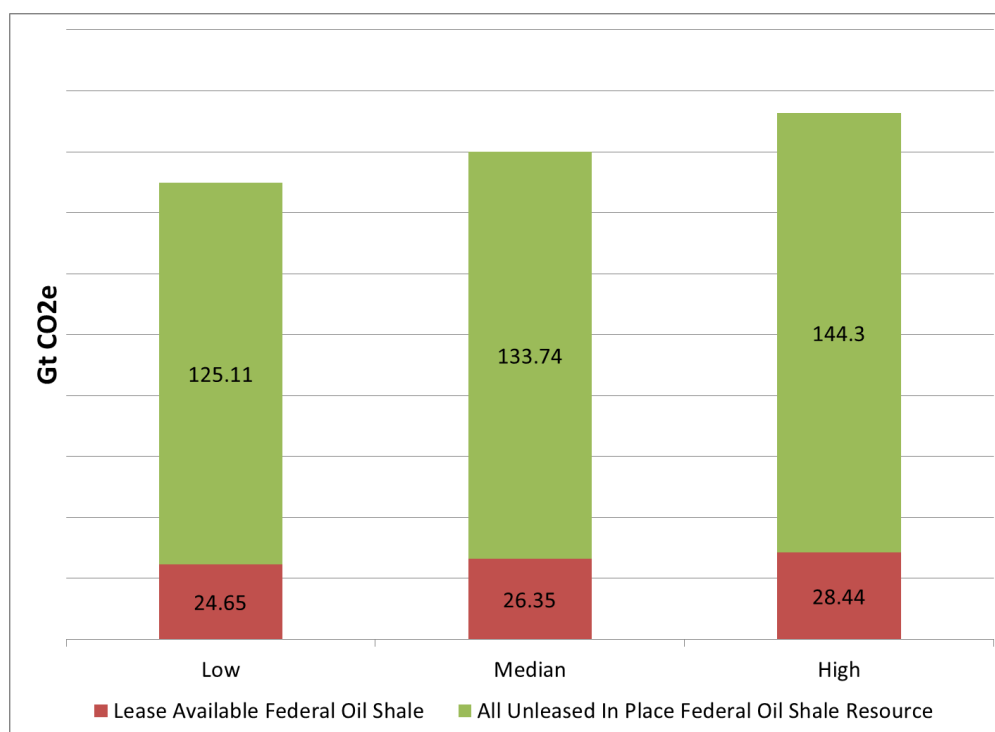


Figure 13. GHG emissions (Gt CO₂e) from federal oil shale under low, median and high emissions scenarios

Crude Oil

The potential GHG emissions of onshore and offshore federal crude oil range from 9.38 to 10.69 and 27.65 to 31.50 Gt CO₂e respectively. The potential GHG emissions of all federal crude oil range from 37.03 to 42.19 Gt CO₂e.

Table 7. GHG emissions (GtCO₂e) from federal crude oil

	Volume (MMBbls)	Low	Median	High
Unleased Federal Crude Oil				
<i>Onshore</i>	33,648	9.38	9.96	10.69
<i>Offshore</i>	74,649	27.65	29.36	31.50
<i>Total</i>	120,433	37.03	39.32	42.19

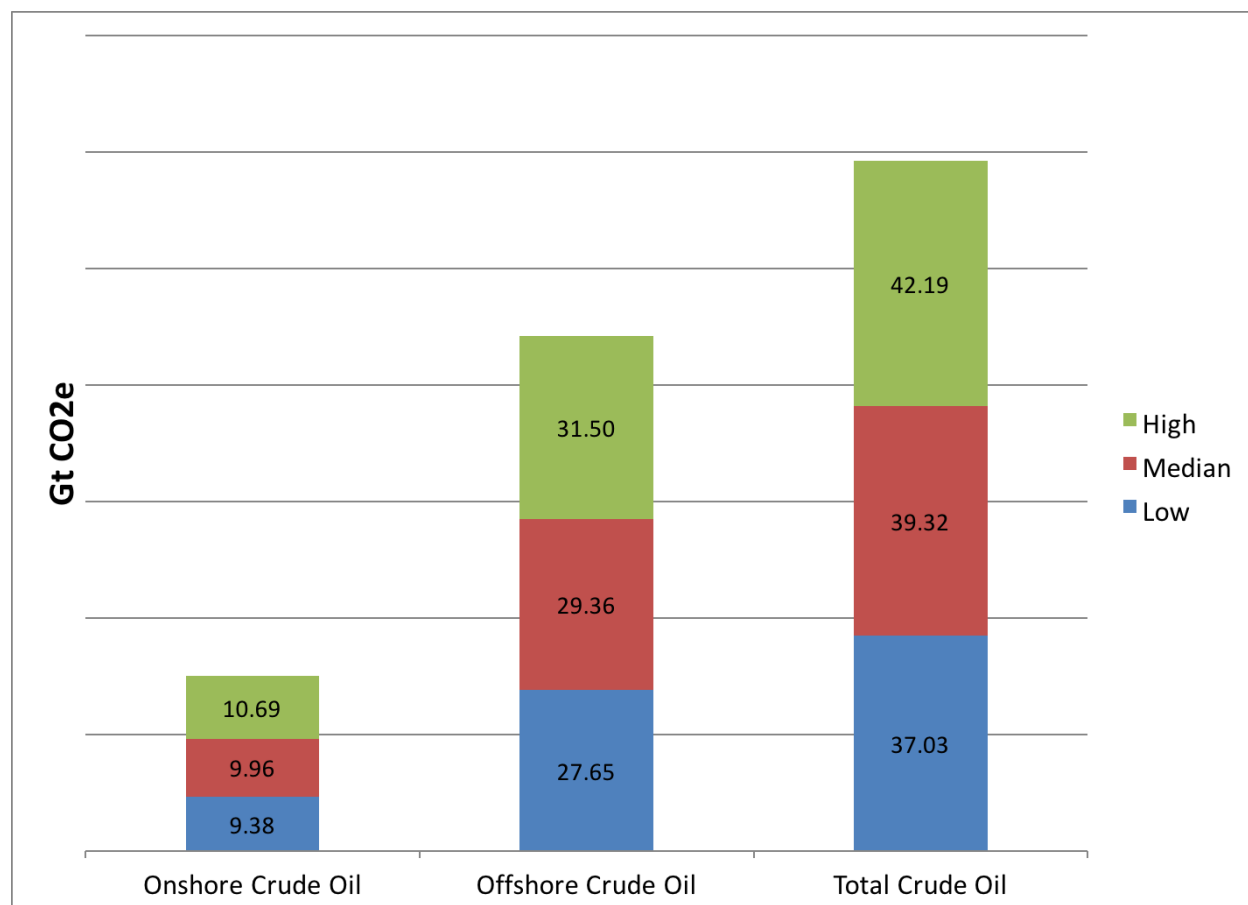


Figure 14. GHG emissions (GtCO₂e) from unleased federal crude oil

Natural Gas

Natural gas emissions were found to be 8–9% of total potential GHG emissions from federal fossil fuels.

Table 8. GHG emissions (GtCO₂e) from federal natural gas

	Volume (Tcfg)	Low	Median	High
Unleased Federal Natural Gas				
<i>Onshore</i>	231	13.79	14.61	17.21
<i>Offshore</i>	405	24.07	25.52	30.05
<i>Total</i>	635	37.86	40.13	47.26

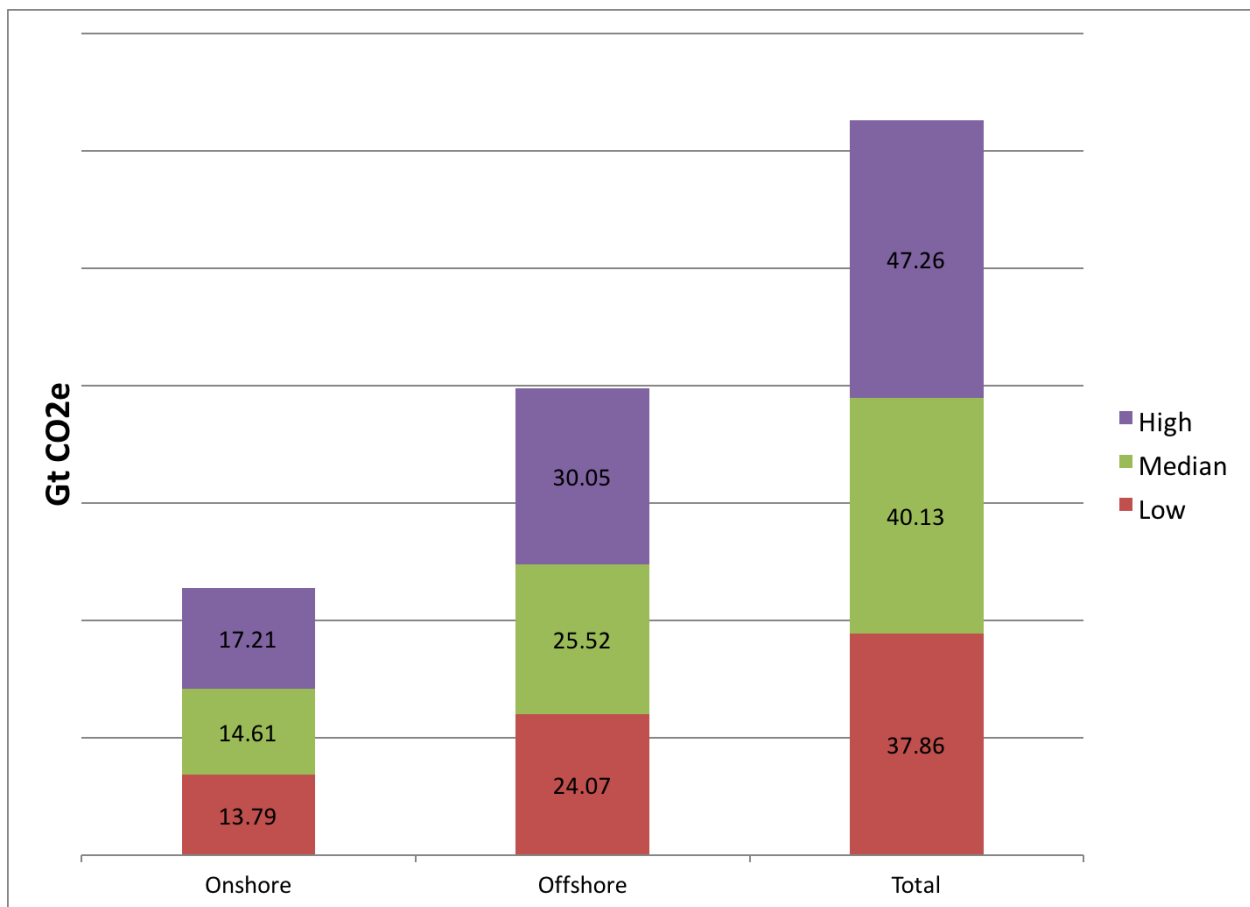


Figure 15. GHG emissions (GtCO₂e) from unleased federal natural gas

Tar Sands

Federal tar sands account for 1-2% of total potential GHG emissions from federal fossil fuels. However, it should be noted that the emissions per barrel of oil processed from tar₂₅

sands is significantly greater than that of crude oil per unit energy. Processing more tar sands into gasoline increases the GHG intensity of that fuel.

Table 9. GHG emissions (GtCO₂e) from federal tar sands

	Volume (MMBbls)	Low	Median	High
Federal Tar Sands				
<i>Lease Available</i>	4,125	1.40	1.41	1.43
<i>Total In Place Resource</i>	16,551	5.62	5.67	5.75

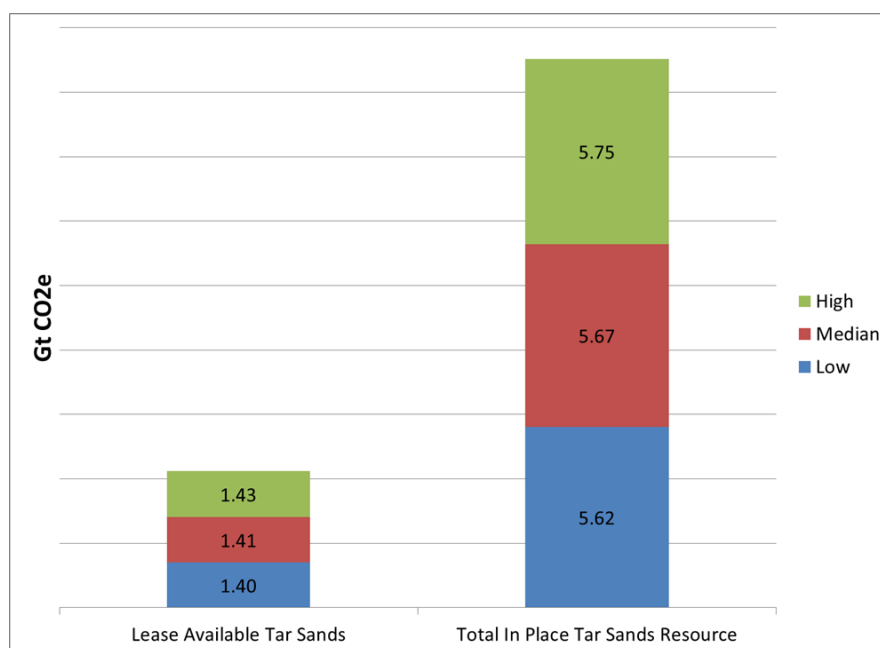


Figure 16. GHG emissions (GtCO₂e) from federal tar sands

IV. Conclusion

This report is the first to estimate the GHG emissions associated with developing federal and non-federal fossil fuels in the United States. Our results show the 100-year global warming potential of emissions resulting from the potential extraction, processing and combustion of fossil fuels under federal mineral rights. The potential GHG emissions savings associated with all federal fossil fuels, leased and unleased, is 349 to 492 GtCO₂e. Our results indicate that a cessation to new federal fossil fuel leasing could keep up to 450 Gt CO₂e from the global pool of potential future GHG emissions.

Studies that have apportioned global emissions quotas among the world's countries indicate that the U.S. share of the global emissions is limited, with varying estimates depending on the equity principles used. For example, Raupach et al. (2014) estimated three U.S. GHG emissions quota scenarios of 85 Gt CO₂e, 220 Gt CO₂e, and 356 Gt CO₂e necessary to maintain only a 50 percent likelihood of avoiding 2°C (3.6°F)

warming by century's end, depending on the equity assumptions used within a total global emissions limit. These represent a range of approximate equity assumptions for apportioning emissions quotas. Under any of those quotas, emissions from new federal fossil fuel leasing are precluded given the potential emissions from already-leased federal fossil fuels and those of non-federal fossil fuels.

Appendix I: Methodology

A1. Quantity of fossil fuels on federal lands

Determining the available fossil fuel volumes on federal lands is the starting point for analyzing the potential GHG emissions (see Appendix II: Table 1). Our approach classified fossil fuels into five broad categories: crude oil, natural gas, coal, oil shale and tar sands. We reviewed the resources used in prior research and determined that the most reliable sources for volumes of fossil fuels on federal lands are the agencies that manage them such as the Bureau of Land Management (BLM), Energy Information Agency (EIA), US Geological Survey (USGS), Office of Natural Resource Revenue (ONRR) and the Department of Interior (DOI).

Where possible we have used the volumes of fossil fuels on federal lands as they are presented in our sources. Where no volume was available, we had to estimate volumes. Onshore and offshore crude oil and natural gas under lease do not have volume estimates available. Data from the Office of Natural Resource Revenue (ONRR) on fiscal years 2014 lease volume revenue and acreage were used, alongside other fossil fuel resource data, to estimate volumes of crude oil and natural gas under lease. Oil shale available under Bureau of Land Management research, development and demonstration (RD&D) leases and its oil shale and tar sands programmatic environmental impact statement and record of decision (OSTS PEIS and ROD) do not have associated volume estimates. Volume estimates were constructed for:

- Onshore Crude Oil Under Lease
- Offshore Crude Oil Under Lease
- Onshore Natural Gas Under Lease
- Offshore Natural Gas Under Lease
- Coal Under Lease
- Oil Shale Available for Lease Under PEIS and ROD
- Oil Shale Available Under RD&D Leases
- Total In Place Federal Oil Shale Resources
- Tar Sands: In Place Federally Owned Resources
- Tar Sands: Lease Available Special Tar Sands Areas
- Unleased Federal Crude Oil
- Unleased Federal Natural Gas
- Unleased Federal Coal

- Unleased Federal Oil Shale
- Unleased Federal Tar Sands
- Non-federal fossil fuels

Onshore Crude Oil Under Lease

The 2008 EPCA inventory estimates the amount of crude oil and natural gas. We used 2014 data to estimate what portion is under active lease. To calculate onshore crude oil under lease, we use the following equation:

$$OCO_{UL} = [ONG_{AUL} \times (FLA_{TRO} \div TA_{AFL})] + OCO_{PR}$$

Where:

OCO_{UL} = Onshore Crude Oil Under Lease, in MMBls

ONG_{AUL} = Fiscal Year 2014 Oil & Natural Gas Nonproducing Acres Under Active Lease

FLA_{TRO}

= Federal lease Available Technically Recoverable Onshore Oil

TA_{AFL} = Total Acres Available for Lease from Figure ES3 of EPCA Phase 3 Inventory 2008

OCO_{PR} = Onshore Crude Oil, Proved, from EPCA Phase 3 Inventory 2008

Offshore Crude Oil Under Lease

To calculate offshore crude oil under lease, we use the following equation:

$$OFCO_{UL} = [OFA_{UAL} \times (OFCO_{LGM} \div OFCO_{LGMA})] + OFCO_{PR}$$

Where:

$OFCO_{UL}$ = Offshore Crude Oil Under Lease, in MMBbls

OFA_{UAL} = 2015 Offshore Nonproducing Acres Under Active Lease

$OFCO_{LGM}$ = Offshore Crude Oil Leased in Gulf of Mexico Nonproducing Volume

$OFCO_{LGMA}$ = Offshore Crude Oil Nonproducing Acres Leased in Gulf of Mexico

$OFCO_{PR}$ = Offshore Crude Oil, Proved, from EPCA Phase 3 Inventory 2008

Onshore Natural Gas Under Lease

To calculate onshore natural gas under lease, we use the following equation:

$$ONG_{UL} = [ONG_{AUL} \times (FLA_{TRNG} \div TA_{AFL})] + ONG_{PR}$$

Where:

ONG_{UL} = Onshore Natural Gas Under Lease, in Tcfg

ONG_{AUL} = Fiscal Year 2014 Oil and Natural Gas Nonproducing Acres Under Lease

FLA_{TRNG} = Federal Lease Available Technically Recoverable Onshore Natural Gas

TA_{AFL} = Total Acres Available for Lease from Figure ES3 of Phase 3 Inventory 2008

ONG_{PR} = Onshore Natural Gas, Proved, from EPCA Phase 3 Inventory 2008

Offshore Natural Gas Under Lease

To calculate offshore natural gas under lease, we use the following equation:

$$OFNG_{UL} = [OFA_{UAL} \times (OFNG_{LGM} \div OFNG_{NP})] + OFNG_{PR}$$

Where:

$OFNG_{UL}$ = Offshore Natural Gas Under Lease, in Tcfg
 OFA_{UAL} = Offshore Nonproducing Acres Under Active Lease
 $OFNG_{LGM}$ = Offshore Natural Gas Leased in Gulf Of Mexico Nonproducing Volume
 $OFNG_{NP}$ = Offshore Natural Gas Nonproducing Acres Leased in Gulf of Mexico
 $OFNG_{PR}$ = Offshore Natural Gas, Proved, from EPCA Phase 3 Inventory

Coal Under Lease

Since nominal amounts of coal under lease were not available, we had to estimate them based on data from GAO, BLM, and the percentage of leased and unmined coal reserves remaining in the Powder River Basin. To calculate coal under lease, we used the following equation:

$$C_L = \sum RLC [(LFC_{A,1990-2012} \div LFC_{T,1990-2012}) \times LFC_{A,2013}] \times RFC_R$$

Where:

C_L = Coal Under Lease, in MST
 $\sum RLC$ = Sum of Remaining Leased Coal for each of the following States (AL, CO, KY, MT, NM, ND, OK, UT, WY, Eastern States)
 $LFC_{A,1990-2012}$ = Leased Federal Coal in Acres (for each state) for the period 1990 – 2012, from Table 1 in GAO 2013
 $LFC_{T,1990-2012}$ = Leased Federal Coal in Tons (for each state) for the period 1990 – 2012, from Table 1 in GAO 2013
 $LFC_{A,2013}$ = Total Leased Federal Coal Acres in Effect (for each state) in 2013 from BLM 2014
 RFC_R = Percentage of leased and unmined coal reserves remaining in Powder River Basin (40.4%) from Wright 2015

Oil Shale Available for Lease Under PEIS and ROD

To calculate the volume of oil shale available for lease under both the PEIS and ROD, we separately estimate the available resource in Utah, Colorado and Wyoming, and sum these estimates.

To estimate the available resource for lease in UT, we use the following equation:

$$OSR_{UT} = AAROD_{UT} \times AR_{UT}$$

Where:

OSR_{UT} = Oil Shale Resource for lease in Utah, in MMBbls
 $AAROD_{UT}$ = Available Area in Utah According to Record of Decision
 AR_{UT} = Average Resource in Utah's Uintah Basin, in bbl/acre

To estimate the available resource for lease in CO, we use the following equation:

$$OSR_{CO} = AAROD_{CO} \times AR_{CO}$$

Where:

OSR_{CO} = Oil Shale Resource in Colorado, in MMBbls
 $AAROD_{CO}$ = Available Area in Colorado According to Record of Decision
 AR_{CO} = Average Resource in Colorado's Piceance Basin, in bbl/acre

To estimate the available resource for lease in WY, we use the following equation:

$$OSR_{WY} = AAROD_{WY} \times AR_{WY}$$

Where:

OSR_{WY} = Oil Shale Resource in Wyoming, in MMBbls
 $AAROD_{WY}$ = Available Area in Wyoming According to Record of Decision
 AR_{WY} = Average Resource in Wyoming's Green River and Washakie Basins, comprised of the average of 6 members, in bbl/acre

Oil Shale Available Under RD&D Leases

To calculate the volume of oil shale available under RD&D leases, we summed up the estimated volumes for the 9 leases detailed in the *Assessment of Plans and Progress on US Bureau of Land Management Oil Shale RD&D Leases in the United States*.¹⁴ Since volume estimates for the American Shale Oil LLC and AuraSource leases are not available in the document, we estimate them using the following equations:

$$OSR_{ASO} = AAL_{ASO} \times AR_{CO}$$

Where:

OSR_{ASO} = Oil Shale Resource in the American Shale Oil, LLC Lease, in MMBbls
 AAL_{ASO}
 = Area Available For Lease (including preference right area) for the American Shale Oil, LLC lease
 AR_{CO} = Average Resource in Colorado's Piceance Basin, in bbl/acre

$$OSR_{AS} = AAL_{AS} \times AR_{UT}$$

Where:

OSR_{AS} = Oil Shale Resource in the AuraSource Lease, in MMBbls
 AAL_{AS} = Area Available For Lease (including preference right area) for the AuraSource lease
 AR_{UT} = Average Resource in Utah's Uintah Basin, in bbl/acre

Total In Place and Geologically Prospective Federal Oil Shale Resources

To calculate the total in place federal oil shale resources, we summed the federal resource available in the Piceance Basin with a yield of over 25 GPT (gallon per ton) in USGS 2010, the federal resource available in the Green River and Washakie Basins of over 15 GPT in USGS 2011, and separately estimated the federal resource available in the Uintah basin.

To estimate the federal resource in the Uintah basin, we use the following equation

$$FOSR_{UB} = AAROD_{UT} \times AR_{UT}$$

Where:

$FOSR_{UB}$ = Federal Oil Shale Resource in the Uintah Basin, in MMBbls

$AAROD_{UT}$ = Available Area in Utah According to Record of Decision

AR_{UT} = Average Resource in Uintah Basin, in bbl/acre

Tar Sands: In Place Federally Owned Resources

To calculate the volume of in place federally owned tar sands resources, we use the following equation:

$$TS_{FOR} = \sum SRfp$$

Where:

TS_{FOR} = In Place Federally Owned Tar Sands Resources, in MMBbl

$\sum SRfp$ = the sum of the federally owned percentages of tar sands resource for each state

As mentioned above, we sum the federally owned percentages of tar sands resources as listed in *Natural Bitumen Resources of the United States*.¹⁵ Where no federal ownership percentage is given in the document, we cite research by Keiter et al. 2012 for the percentage of Utah tar sands that are federal and Gorte et al. 2011 for all other states.

Tar Sands: Lease Available STSAs

To calculate the volume for Lease Available STSAs, we multiply the area available for each STSA by the resource for that area. STSA areas are taken from as presented in the 2013 ROD.¹⁶

The available resource for each area is taken from *Unconventional Energy Resources: 2013 Review*.¹⁷ This review unfortunately does not provide estimates for Raven Ridge

or San Rafael STSAs; for those, we used a low per-acre estimate (from the P.R. Spring STSA) of 25,900 barrels per acre. We then sum all of these volumes.

Unleased Federal Crude Oil

To calculate unleased federal offshore crude oil, we use the following equation:

$$OFCO_{ULL} = OFCO_{TR}$$

Where:

$OFCO_{ULL}$ = Unleased Federal Offshore Crude Oil

$OFCO_{TR}$ = Technically Recoverable Federal Offshore Crude Oil

To calculate unleased federal onshore crude oil, we use the following equation:

$$OCO_{ULL} = OCO_{TR}$$

Where:

OCO_{ULL} = Unleased Federal Onshore Crude Oil

OCO_{TR} = Technically Recoverable Federal Onshore Crude Oil

Unleased Federal Natural Gas

To calculate unleased federal offshore natural gas, we use the following equation:

$$OFNG_{ULL} = OFNG_{TR}$$

Where:

$OFNG_{ULL}$ = Unleased Federal Offshore Natural Gas

$OFNG_{TR}$ = Technically Recoverable Federal Offshore Natural Gas

To calculate unleased federal onshore natural gas, we use the following equation:

$$ONG_{ULL} = ONG_{TR}$$

Where:

ONG_{ULL} = Unleased Federal Onshore Natural Gas

ONG_{TR} = Technically Recoverable Federal Onshore Natural Gas

Unleased Federal Coal

To calculate unleased federal coal, we use the following equation:

$$FC_{ULL} = FC_{RR} - \left\{ \left(\frac{FC_{TIR}}{BLM_{AUM}} \right) \times CLA_{2013} \right\}$$

Where:

FC_{ULL} = Unleased Federal Coal

FC_{RR} = Federal Recoverable Coal Reserves from NMA 2012

FC_{TIR} = Total Federal In Place Coal Resource from USDA, USDOE, USDOJ 2007

BLM_{AUM} = Acres Under BLM Management from BLM 2014

CLA_{2013} = 2013 Leased Coal Acres from BLM 2014

Unleased Federal Oil Shale

To calculate unleased federal oil shale, we subtract Federal Oil Shale Available under RD&D Leases from DOE/BLM 2013 from Total In Place Geologically Prospective Federal Oil Shale Resources as described earlier.

Unleased Federal Tar Sands

To calculate unleased federal tar sands, we assume the total in place federal tar sands resources are unleased.

Non-federal Fossil Fuels

Non-federal fossil fuels volumes are calculated for each fossil fuel category by subtracting federal fossil fuel volumes from total technically recoverable oil resources, total technically recoverable natural gas resources, and total us recoverable coal reserves in the U.S. as provided by EIA 2012a. There are no non-federal tar sands and oil shale resources studied in this study.

For each oil, natural gas and coal resource:

$$NFFF = TTR - FFF$$

Where:

$NFFF$ = Non-federal Fossil Fuel

TTR = Total Technically Recoverable Resource

FFF = Federal Fossil Fuel

A2. Fossil Fuel to Primary Energy Conversions

We converted volumes of fossil fuels into primary energy as this allowed us to make necessary adjustments and apply resource specific life-cycle GHG emissions factors, as those are presented in units of energy. For example, the life-cycle GHG emissions factors are typically on a product-delivered basis (kWh of electricity, MJ of thermal energy), so the fossil fuel reserves must be adjusted because only a portion of the fossil fuel becomes a final product delivered.



Figure A17. Determining quantities of energy to multiply by emissions factor

We used the following assumptions to convert fossil fuel amounts to primary energy:

Table A10. Energy content of fossil fuels

Fossil Fuel	Energy Content	Source
Crude Oil	5,746 MJ / barrel (LHV)	ORNL 2011
Natural Gas	983 btu / ft ³ (LHV)	ORNL 2011
Coal	20.61 btu / ton (HHV)	ORNL 2011
Oil Shale	5,746 MJ / barrel (LHV)	ORNL 2011
Tar Sands	5,746 MJ / barrel (LHV)	ORNL 2011

Proportions of Resource Used as Input for End-use Products

The proportions of resource used as input for end-use products were needed in order to appropriately divide the initial fossil fuel amounts. The proportions make it possible to apply end-use product specific life-cycle emissions factors, which account for the full

life-cycle GHG emissions associated with each end-use product. These proportions do not take into account the energy required to process the fossil fuel resource and move it downstream. They only describe a percentage of the fossil fuel resource that will ultimately be used in end-use products and sectors.

Crude Oil

Proportions of Crude Oil used for various end-use products were derived from the EIA.¹⁸ To calculate proportions each of the top seven petroleum products consumed in 2013 was divided by the total annual consumption of petroleum products. These top seven products are:

- Finished Motor Gasoline
- Distillate Fuel Oil
- Kerosene
- Liquefied Petroleum Gases (LPG)
- Petroleum Coke
- Still Gas
- Residual Fuel Oil

Dividing the consumption of each end product by the total annual consumption of petroleum products enabled us to reconstruct the demand for petroleum products, and thus the hypothetical product output of a crude oil refinery.

For this method, we used the following equation:

$$CO_{EUPP} = AC_{EUP} \div AC_{APP}$$

Where:

CO_{EUPP} = Crude Oil End Use Product Proportion
 AC_{EUP} = Annual Consumption of End Use Product
 AC_{APP} = Annual Consumption of All Petroleum Products

Natural Gas

Proportions of Natural Gas used for each end-use sector were derived from the EIA's *Natural Gas Consumption by Sector in the Reference case, 1990-2040: History: U.S. Energy Information Administration, Monthly Energy Review*.¹⁹ For each end-use sector, the sector specific annual natural gas consumption was divided by the total annual natural gas consumption. These end-use sectors are:

- Residential
- Commercial
- Industrial
- Electric Power
- Transportation

For this method we used the following equation:

$$NG_{EUSP} = AC_{EUS} \div AC_{ANG}$$

Where:

NG_{EUSP} = Natural Gas End Use Sector Proportion

AC_{EUS} = Annual Consumption by End Use Sector

AC_{ANG} = Annual Consumption of All Natural Gas

Coal

Proportions of Coal used for each end-use sector were derived from the EIA's *Quarterly Coal Report – April – June 2014: Table 32 - U.S. Coal Consumption by End-Use Sector, 2008 – 2014*.²⁰ For each end-use sector, the sector specific annual coal consumption was divided by the total annual coal consumption. These end-use sectors are:

- Electric Power
- Coke
- Other Industrial Use

For this method, we use the following equation:

$$C_{EUSP} = AC_{EUS} \div AC_{AC}$$

Where:

C_{EUSP} = Coal End Use Sector Proportion

AC_{EUS} = Annual Consumption by End Use Sector

AC_{AC} = Annual Consumption of All Coal

Oil Shale

For oil shale we assume the same end-use products will be refined from a barrel of crude oil derived from oil shale. We apply the same end-use product proportions as calculated for Crude Oil.

Tar Sands

For tar sands we assume the same end-use products will be refined from a barrel of crude oil derived from tar sands as has been assumed in other research.²¹ We apply the same end-use product proportions as calculated for Crude Oil.

Primary Energy Factors

Making energy products requires energy. To account for the energy in the reserve required to make the final end products, we determined a ratio of primary energy to the end use, resulting in a Primary Energy Factor. The Primary Energy Factor represents the relationship between the amount of energy required to make the end product and the amount of end product. In the case of coal-based electricity, it is the amount of energy needed to make 1 kWh of coal fired electricity, which will always be >1 kWh. For this study only about 30% of the total coal resource becomes electricity delivered from coal-fired generation; it requires about 3.3 kWh of coal resource to make and deliver 1 kWh of coal electricity. Our methodology assumes the energy required to process the fossil fuel resource into the end product is internal, meaning it comes from the resource. This means that some portion of the fossil fuel resource is consumed making the fossil fuel product. The primary energy factor helps understand the total amount of fossil fuel products and has no impact on the life-cycle GHG emissions, which are accounted for in the emissions factors.

For many end products, primary energy factors are available, as “source energy factors” from the National Renewable Energy Laboratory’s *Fuels and Energy Precombustion LCI Data Module*.²² We used these source energy factors, which represent the energy required to extract, process, and deliver fuel, as Primary Energy Factors. We used NREL’s ‘source energy factors’ for all end products except:

- Natural Gas Use in the Electric Power Sector
- Coal Use in the Electric Power Sector
- Coal Use in manufacturing Metallurgical Coke
- Coal Use in Other Industrial Use
- End Products Derived from Oil Shale and Tar Sands

Natural Gas Use in the Electric Power Sector

To calculate the Primary Energy Factor for Natural Gas Use in the Electric Power Sector, we converted the volume (ft³) of Natural Gas delivered in 2013 to customers in the Electric Power Sector from EIA’s *February 2015 Monthly Energy Review*²³ into kWh, took the 2013 net electrical generation from Natural Gas (kWh) by Electric Power Sector customers in EIA’s *February 2015 Monthly Energy Review*,²⁴ and the source energy factor for Natural Gas from Deru and Torcellini 2007.

To calculate the Primary Energy Factor for Natural Gas Use in the Electric Power Sector, we used the following equation:

$$PEFNG_{EPS} = NGD_{EPS} \div NEGNG_{EPS}$$

Where:

PEFNG_{EPS} = Primary Energy Factor for Natural Gas Use in the Electric Power Sector

NGD_{EPS} = Natural Gas Delivered to Electric Power Sector Customers in 2013

NEGNG_{EPS} = Net Electrical Generation from Natural Gas by Electric Power

For other Natural Gas end-use sectors, we assume all heat not converted to electricity is useful. For the Electric Power Sector, however, we assume all heat is lost.

Coal Use in the Electric Power Sector

For Coal Use in the Electric Power Sector, we converted the quantity of coal consumed by the Electric Power Sector in *Quarterly Coal Report – April – June 2014: Table 32 - U.S. Coal Consumption by End-Use Sector, 2008 – 2014*²⁵ into kWh, we took the 2013 net electrical generation from Coal (kWh) by Electric Power Sector customers in EIA’s *February 2015 Monthly Energy Review (2015b)*, and the source energy factor for Coal.²⁶

To calculate the Primary Energy for Coal Use in the Electric Power Sector, we used the following equation:

$$PEFC_{EPS} = CD_{EPS} \div NEGC_{EPS}$$

Where:

$PEFC_{EPS}$ = Primary Energy Factor for Coal Use in the Electric Power Sector

CD_{EPS} = Coal Delivered to Electric Power Sector Customers in 2013

$NEGC_{EPS}$ = Net Electrical Generation from Coal by Electric Power Customers in 2013

For Coal Use in the manufacture of Metallurgical Coke, we used values in World Coal Association 2015. For Coal Use in Other Industrial Use, we use the same Primary Energy Factor as that calculated for Coal Use in the Electric Power sector.

End Products Derived From Oil Shale and Tar Sands

The primary energy resource available for end products derived from oil shale and tar sands needs to be adjusted for the increased energy required to extract and process both the oil shale and tar sands. We assume the additional energy required for these processes comes from the primary energy resource itself, otherwise referred to as ‘internal’ energy. Since the primary energy factors used²⁷ are aggregates of several components (exploration, extraction, processing, and refining into end products), and do not list the primary energy factors for each of these components, we had to disaggregate the factors and backwards calculate the primary energy factor of just the refining component. To do this we use the following equation for each end product derived from crude oil:

$$PEFCO_{REP} = (PEFCO_{EP}) - \left(\frac{1}{EROI_{CO}}\right)$$

Where:

$PEFCO_{REP}$

= Primary Energy Factor of Refining the End Product From Crude Oil, exclusive of energy required for exploration, extraction, and processing

$PEFCO_{EP}$ = Primary Energy Factor of End Product, inclusive of all processes

$EROI_{CO}$ = Energy Return On Investment from Crude Oil

For End Products Derived from Oil Shale, we adjust the Primary Energy Factors of refining components of end products derived from Crude Oil by the following adjustment mechanism:

$$PEFOS_{EP} = PEFCO_{REP} + \left(\frac{1}{EROI_{OS}} \right)$$

Where:

$PEFOS_{EP}$ = Primary Energy Factor of Oil Shale Derived End Product

$PEFCO_{REP}$ = Primary Energy Factor of Refining Component of End Product

$EROI_{OS}$ = Energy Return ON Investment from Oil Shale, from Brand 2009

For End Products Derived from Tar Sands, we adjust the Primary Energy Factors of refining components of end products derived from Crude Oil by the following adjustment mechanism:

$$PEFTS_{EP} = PEFCO_{REP} + \left(\frac{1}{EROI_{TS}} \right)$$

Where:

$PEFOS_{EP}$ = Primary Energy Factor of Oil Shale Derived End Product

$PEFCO_{REP}$ = Primary Energy Factor of Refining Component of End Product

$EROI_{OS}$ = Energy Return ON Investment from Oil Shale²⁸

Emissions Factors

The approach used in this study was to use emissions factors that represent the functional units for which we had data on fossil fuels amounts. For example, if the functional unit of the emissions factor was a kWh worth of electricity, we estimated the total amount of resource that can be converted into this functional unit. Where the emissions factor is provided on an energy unit basis that is not equivalent to that of the fossil fuel resource, we make the appropriate conversion.

All life-cycle emissions factors used in this study, and nearly all in the literature, are on an end-use product basis (i.e., kWh of electricity, MJ of final fuel combusted, km-travelled, etc.). To account for the energy in the feedstock required to make the end-use products, we determined a ratio of primary energy to the end-use product, as described 40

earlier in this Appendix. This represents the relationship between the amount of energy required to make the final product.

We were able to find resource-specific life-cycle emissions factors for all fossil fuel categories. These life-cycle emissions factors account for the greenhouse gas emissions associated with all life-cycle stages associated with the production of an end product derived from a fossil fuel feedstock.

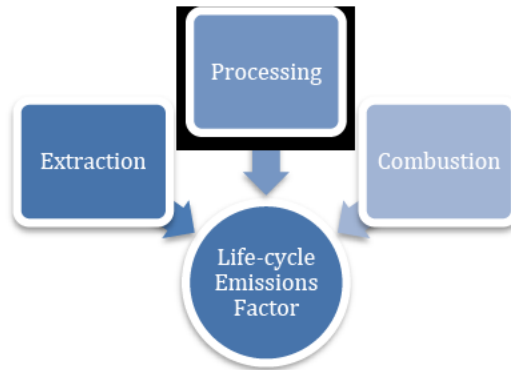


Figure A18. Example life-cycle stages accounted for in a life-cycle emissions factor

For each emissions factor we evaluated low, median and high emission factor scenarios. The base case in this study is the low emissions factor scenario, which is the most conservative estimate of the GHG emissions from developing fossil fuels. This was done to account for a static emissions factor; we optimistically assume that GHG emissions per unit energy improve over time compared to *ex post* emissions factors in the literature as more efficient energy and public policy and best practices limit fugitive emissions.

Where possible we used harmonized life-cycle emissions factors found in the literature. Harmonization is a meta-analytical process used to develop robust, analytically consistent and current comparisons of estimates of life-cycle GHG emissions factors, which have been scientifically studied and published in academic, peer-reviewed literature.

For some end-use products, however, specific emissions factors were not available in the literature. We make adjustments to the emissions factors for the following:

- Natural Gas extracted from non-conventional, shale based natural gas resource
- All end products (except Gasoline) derived from Oil Shale
- LPG, Petroleum Coke, Still Gas, and Residual Fuel Oil derived from Tar Sands
- Natural Gas Used in the Transportation Sector

Natural Gas Extracted From Non-Conventional, Shale-based Natural Gas Resource

To account for the difference in emissions resulting from conventional natural gas extraction and non-conventional natural gas extraction, we apply shale-gas specific emissions-factors to a percentage of the total Natural Gas fossil fuel volume. We assume this to be 27% and take this figure from EIA's *Technically Recoverable Shale Oil and Shale Gas Resources: An Assessment of 137 Shale Formations in 41 Countries Outside the United States* (2013). We use shale-gas specific emissions factors from Burnham et al. 2012 and Heath et al. 2014.

All End Products (Except Gasoline) Derived From Oil Shale

Specific emissions factors for finished motor gasoline derived from oil shale was available in the literature. Emissions factors for the remainder of the end products, however, were not.

To account for the difference in emissions between conventional crude oil extraction and processing and the extraction and processing of Oil Shale into an equivalent barrel of standard crude oil, we adjust the end product specific emissions factors using the following equation:

$$OSE_{AF} = (FMG_{OS} - FMG_{CO}) \div FMG_{CO}$$

Where:

OSE_{AF} = Oil Shale Emissions Adjustment Factor

FMG_{OS} = Finished Motor Gasoline from Oil Shale Emissions Factor from Brandt 2009

FMG_{CO} = Finished Motor Gasoline from Crude Oil Emissions Factor from Burnham, et al. 2012

We then multiply each crude oil end product specific emissions factor by $(1 + OSE_{AF})$ to appropriately increase the emissions factor due to the increased emissions resulting from Oil Shale extraction and processing. The emissions factor from Brandt 2009 used above is an Oil Shale specific emissions factor.

LPG, Petroleum Coke, Still Gas and Residual Fuel Oil Derived From Tar Sands

Specific emissions factors for finished motor gasoline, distillate fuel oil and kerosene were available in the literature. However, specific emissions factors for other end-use products were not. To account for the difference in emissions between conventional crude oil extraction and processing and the extraction and processing of Tar Sands into an equivalent barrel of standard crude oil, we adjust the end product specific emissions factors using the following equation:

TSE_{AF} = the average of:

$$(FMG_{TS} - FMG_{CO}) \div FMG_{CO};$$

$$(DFO_{TS} - DFO_{CO}) \div DFO_{CO};$$

and

$$(K_{TS} - K_{CO}) \div K_{CO}$$

Where:

TSE_{AF} = Tar Sands Emissions Adjustment Factor

FMG_{TS} = Finished Motor Gasoline from Tar Sands Emissions Factor²⁹

FMG_{CO} = Finished Motor Gasoline from Crude Oil Emissions Factor³⁰

DFO_{TS} = Distillate Fuel Oil from Tar Sands Emissions Factor³¹

DFO_{CO} = Distillate Fuel Oil from Crude Oil Emissions Factor³²

K_{TS} = Kerosene from Tar Sands Emissions Factor³³

K_{CO} = Kerosene from Crude Oil Emissions Factor³⁴

We then multiply the LPG, Petroleum Coke, Still Gas and Residual Fuel Oil from Crude Oil emissions factors by $(1 + TSE_{AF})$.

Natural Gas Used in the Transportation Sector

In order to more accurately estimate the emissions from natural gas use in the transportation sector, we use EIA data³⁵ to determine what percentage of natural gas is used by light duty compressed natural gas (CNG) vehicles, and what percentage is used by medium and heavy duty CNG vehicles. We then apply these proportions to the transportation portion of natural gas primary energy volumes.

To calculate GHG emissions, we use life-cycle emissions factors for CNG transportation.³⁶ Since the emissions factors from Burnham et al. are measured in km-travelled, we need the fuel economy to determine the distance each mode of transport can travel based upon a unit of gas. We use EPA data to estimate the fuel economy of light duty vehicles.³⁷ For the fuel economy of medium and heavy duty vehicles, we cite research from NREL.³⁸ Once energy available is expressed in the functional units of the life-cycle emissions factors, we can estimate potential GHGs.

Research Limitations

There are several limitations to this model. The major limitation is the unavailability of some kinds of data that would allow for a better approximation of global warming potential from developing fossil fuels. For example, tar sands reserves are not well characterized as amounts are reported in “acres” and estimates must be made by applying a “barrel per acre” estimate instead of absolute amounts, which would be easier to compare with other reserves. In addition, existing fossil fuel amounts under lease were mostly unavailable. There is also no specific data for all of the crude oil end products. Literature on life-cycle emissions factors for oil shale and tar sands not as extensive as for other resources and come with higher ranges of uncertainty. There is also no federal ownership of figures for Tar Sands in Alabama, Texas, California, Kentucky, New Mexico, Wyoming and Oklahoma. Finally, emissions factors used in this study were static over time and based on *ex post* (actual) data. Our GHG emissions

model assumes that the combustion efficiency or GHG intensity across the fleet of U.S. fossil fuel-fired power plants remains static over time.

Appendix II: Data Sources

Table A11. Fossil fuel amounts and sources

Fossil Fuel Type	Quantity	Source(s) Used
Crude Oil		
Offshore		
Federal Technically Recoverable	89,930 MMBbls	BOEM 2014
Federal Proved (2013)	5,137 MMBbls	EIA 2015a
FY 2014 Crude Oil Volume Revenues Reported	396.36 MMBbls	ONRR 2014
February 2015 Producing Leases – Acreage	4,980,054 acres	BOEM 2015
Acreage Under Active Lease	32,184,001 acres	BOEM 2015
Leased in Gulf of Mexico (non-producing/not subject to exploration & development plans)	17,900 MMBbls	DOI 2012
Non-producing Acreage Leased in Gulf of Mexico	23,849,584 acres	BOEM 2015
All Non-producing Acreage Leased	27,203,947 acres	DOI 2012
Onshore		
Federal Technically Recoverable	30,503 MMBbls	EPCA Phase 3 Inventory 2008
Federal Lease Available Technically Recoverable*	18,989 MMBbls	EPCA Phase 3 Inventory 2008
Federal Proved	5,344 MMBbls	EPCA Phase 3 Inventory 2008
FY 2014 Crude Oil Volume Revenues Reported	146.23 MMBbls	ONRR 2014
FY 2014 O&NG Producing Leases – Acreage	12,690,806 acres	BLM 2014a
FY 2014 O&NG Acres Under Lease	34,592,450 acres	BLM 2014a
Total Technically Recoverable Resource	220,200 MMBbls	EIA 2012a
Natural Gas		
Offshore		
Technically Recoverable	404.52 Tcfg	BOEM 2014
Federal Proved Gas	25.33 Tcfg	EIA 2014c
FY 2014 Natural Gas Volume Revenues Reported	0.85 Tcfg	ONRR 2014
February 2015 Producing Leases – Acreage	4,980,054 acres	BOEM 2015
Acreage Under Active Lease	32,184,001 acres	BOEM 2015
Leased in Gulf of Mexico (non-producing/not subject to exploration & development plans)	49.70 Tcfg	DOI 2012
Non-producing Acreage Leased in Gulf of Mexico	23,849,584 acres	BOEM 2015
All Non-producing Acreage Leased	27,203,947 acres	BOEM 2015
Onshore		
Technically Recoverable	230.98 Tcfg	EPCA Phase 3 Inventory 2008
Lease Available Technically Recoverable*	194.907 Tcfg	EPCA Phase 3 Inventory 2008
Proved Gas	68.76 Tcfg	EPCA Phase 3 Inventory 2008

Total Technically Recoverable Resource	2,203.30 Tcfg	EIA 2012a
Coal		
In Place Federal Coal Resources	957,000 MST	USDA, DOE, DOI 2007
Federal Recoverable Coal Reserves	87,000 MST	National Mining Association 2012
Total U.S. Recoverable Reserves	256,000 MST	EIA 2012b
2013 Leased Coal Acres	474,025 acres	BLM 2014b
2013 Coal Production	422.25 MST	ONRR 2013
Oil Shale		
Available Area According to ROD – UT*	360,400 acres	BLM ROD 2013
Available Area According to ROD – CO*	26,300 acres	BLM ROD 2013
Available Area According to ROD – WY*	292,000 acres	BLM ROD 2013
Average Resource – UT	74,093 bbl/acre	BLM OSTS 2012
Average Resource – WY	120,117 bbl/acre	BLM OSTS 2012
Average Resource – CO	300,000 bbl/acre	Mercier, et al. 2010
Resource Available in Piceance Basin	284,800 MMBbls	USGS 2010
Resource Available in Green River and Washakie Basins	72,179 MMBbls	USGS 2011
Resource Available in Uinta Basin	26,699 MMBbls	BLM OSTS 2012; BLM ROD 2013
Available Under RD&D Leases	5,938 MMBbls	DOE/BLM 2013
Tar Sands		
In Place Tar Sands Resources	54,095 MMBbls	USGS 2006
Federal Ownership of Utah Tar Sands	58%	Keiter et al. 2011
Federal Ownership of Other Tar Sands	28%	Gorte et al. 2012
Lease Available STSAs*	4,125 MMBbls	BLM OSTS 2012

* “Lease-available” federal fossil fuels are unleased federal fossil fuels that are available for leasing under current federal policies and plans.

Table A12. End-use products/sectors and life-cycle emissions factor sources

End-use Product / Sector	Key Parameter(s) for Influencing Low, Median, High Emissions Scenarios	Life-Cycle Emission Factor Source(s) Used
<u>Crude Oil</u>		
Gasoline	Associated gas venting and flaring; vehicle end-use efficiency	Burnham et al. 2012
Distillate Fuel Oil	Extraction and transport	NETL 2008, 2009 as cited in US DOS 2014
Kerosene	Extraction and transport	NETL 2008, 2009 as cited in US DOS 2014
Liquefied Petroleum Gases (LPG)	Extraction and transport	Venkatesh et al. 2010
Petroleum Coke	Extraction and transport	Venkatesh et al. 2010
Still Gas	Extraction and transport	Venkatesh et al. 2010
Residual Fuel Oil	Extraction and transport	Venkatesh et al. 2010
<u>Natural Gas</u>		
Residential	Liquid unloadings (venting); well equipment (leakage and venting); transmission and distribution (leakage and venting)	Burnham et al. 2012
Commercial	Liquid unloadings (venting); well equipment (leakage and venting); transmission and distribution (leakage and venting)	Burnham et al. 2012
Industrial	Liquid unloadings (venting); well equipment (leakage and venting); transmission and distribution (leakage and venting)	Burnham et al. 2012
Electric Power	Power conversion efficiency	Heath et al. 2014
Transportation	Liquid unloadings (venting); well equipment (leakage and venting); transmission and distribution (leakage and venting)	Burnham et al. 2012
<u>Coal</u>		
Electric Power	Transmission and distribution losses; power conversion efficiency; coal mine methane	Whitaker et al. 2012
Coke		EPA 2004
Other Industrial Use	Transmission and distribution losses; power conversion efficiency; coal mine methane	Whitaker et al. 2012
<u>Oil Shale</u>		
Gasoline	Retorting; upgrading; refining	Brandt 2009
Distillate Fuel Oil	Retorting; upgrading; refining; extraction	Brandt 2009; Burnham et al. 2012; NETL 2008, 2009 as cited in US DOS 2014
Liquefied Petroleum Gases (LPG)	Retorting; upgrading; refining; extraction; transport	Brandt 2009; Burnham et al. 2012; Venkatesh et al. 2010
Kerosene	Retorting; upgrading; refining; extraction; transport	Brandt 2009; Burnham et al. 2012; NETL 2008, 2009 as cited in US DOS 2014
Petroleum Coke	Retorting; upgrading; refining;	Brandt 2009; Burnham et al. 2012;

	extraction; transport	Venkatesh et al. 2010
Still Gas	Retorting; upgrading; refining; extraction; transport	Brandt 2009; Burnham, et al. 2012; Venkatesh et al. 2010
Residual Fuel Oil	Retorting; upgrading; refining; extraction; transport	Brandt 2009; Burnham et al. 2012; Venkatesh et al. 2010
Tar Sands		
Gasoline	Feedstock mixture (consisting of dilbit, synthetic crude oil, bitumen)	Jacobs 2009, NETL 2008, 2009, and TIAX 2009 as cited in DOS 2014
Distillate Fuel Oil	Feedstock mixture (consisting of dilbit, synthetic crude oil, bitumen)	Jacobs 2009, and NETL 2008, 2009 as cited in DOS 2014
Liquefied Petroleum Gases (LPG)	Feedstock mixture (consisting of dilbit, synthetic crude oil, bitumen)	Jacobs 2009, NETL 2008, 2009, and TIAX 2009 as cited in US DOS 2014; Venkatesh et al. 2010
Kerosene	Feedstock mixture (consisting of dilbit, synthetic crude oil, bitumen)	NETL 2008, 2009 as cited in DOS 2014
Petroleum Coke	Feedstock mixture (consisting of dilbit, synthetic crude oil, bitumen)	Jacobs 2009, NETL 2008, 2009, and TIAX 2009 as cited in DOS 2014; Venkatesh et al. 2010
Still Gas	Feedstock mixture (consisting of dilbit, synthetic crude oil, bitumen)	Jacobs 2009, NETL 2008, 2009, and TIAX 2009 as cited in DOS 2014; Venkatesh et al. 2010
Residual Fuel Oil	Feedstock mixture (consisting of dilbit, synthetic crude oil, bitumen)	Jacobs 2009, NETL 2008, 2009, and TIAX 2009 as cited in DOS 2014; Venkatesh et al. 2010

Table A13. Crude oil end products and emissions factors

Crude Oil End-use Product	Proportion of Resource Used as Input for End-use Product	Carbon Storage Factor	Low Emissions Factor	Median Emissions Factor	High Emissions Factor	Primary Energy Factor
Finished Motor Gasoline	46.46%	0.00	86 tons CO ₂ e / TJ Fuel Combusted	92 tons CO ₂ e / TJ Fuel Combusted	98 tons CO ₂ e / TJ Fuel Combusted	1.19
Distillate Fuel Oil	17.92%	0.50	89 tons CO ₂ e / TJ Fuel Combusted	90 tons CO ₂ e / TJ Fuel Combusted	96 tons CO ₂ e / TJ Fuel Combusted	1.16
Kerosene	7.51%	0.00	86 tons CO ₂ e / TJ Fuel Combusted	88 tons CO ₂ e / TJ Fuel Combusted	91 tons CO ₂ e / TJ Fuel Combusted	1.21
Liquefied Petroleum Gases	12.75%	0.59	80 tons CO ₂ e / TJ Fuel Combusted	88 tons CO ₂ e / TJ Fuel Combusted	100 tons CO ₂ e / TJ Fuel Combusted	1.15
Petroleum Coke	1.87%	0.30	130 tons CO ₂ e / TJ Fuel Combusted	144 tons CO ₂ e / TJ Fuel Combusted	160 tons CO ₂ e / TJ Fuel Combusted	1.05
Still Gas	3.72%	0.59	78 tons CO ₂ e / TJ Fuel Combusted	87 tons CO ₂ e / TJ Fuel Combusted	100 tons CO ₂ e / TJ Fuel Combusted	1.09
Residual Fuel Oil	1.70%	0.00	88 tons CO ₂ e / TJ Fuel Combusted	95 tons CO ₂ e / TJ Fuel Combusted	110 tons CO ₂ e / TJ Fuel Combusted	1.19
Asphalt*	1.71%	1.00		--		--
Other Oils*	0.56%	1.00		--		--
Lubricants*	0.64%	1.00		--		--
Other*	5.16%	1.00		--		--

Table A14. Natural gas end-use sectors and factors

Natural Gas End-use Sector (product)	Proportion of Resource Used as Input for End-use Product	Primary Energy Yield Factor	Low Emissions Factor	Median Emissions Factor	High Emissions Factor	Primary Energy Factor
Residential (CHP)	18.76%	100%	72 tons CO ₂ e / MJ of fuel combusted	76 tons CO ₂ e / MJ of fuel combusted	81 tons CO ₂ e / MJ of fuel combusted	1.092
Commercial (CHP)	12.44%	100%	72 tons CO ₂ e / MJ of fuel combusted	76 tons CO ₂ e / MJ of fuel combusted	81 tons CO ₂ e / MJ of fuel combusted	1.092
Industrial (CHP)	34.14%	100%	72 tons CO ₂ e / MJ of fuel combusted	76 tons CO ₂ e / MJ of fuel combusted	81 tons CO ₂ e / MJ of fuel combusted	1.092
Electric Power (kWh)	31.69%	43.39%	117 tons CO ₂ e / MJ of fuel combusted	125 tons CO ₂ e / MJ of fuel combusted	180 tons CO ₂ e / MJ of fuel combusted	1.092
Transportation (km-travelled)	2.98%	100%	210 grams CO ₂ e / km travelled	230 grams CO ₂ e / km travelled	250 grams CO ₂ e / km travelled	1.092

Table A15. Coal end-use sectors and factors

Coal End-use Sector (product)	Proportion of Resource Used as Input for End-use Product	Primary Energy Yield Factor	Low Emissions Factor	Median Emissions Factor	High Emissions Factor	Primary Energy Factor
Electric Power (kWh)	92.78%	31.65%	203 tons CO ₂ e / TJ of fuel combusted	272 tons CO ₂ e / TJ of fuel combusted	381 tons CO ₂ e / TJ of fuel combusted	1.048
Metallurgical Coke (pig iron)	2.32%	n/a		1.35 tons of CO ₂ e / ton of pig iron produced		1.167
Other Industrial Use (kWh)	4.89%	31.65%	203 tons CO ₂ e / TJ of fuel combusted	272 tons of CO ₂ e / TJ of fuel combusted	381 tons CO ₂ e / TJ of fuel combusted	1.048

Table A16. Oil shale end-use products and factors

Oil Shale End-use Product	Proportion of Resource Used as Input for End-use Product	Carbon Storage Factor	Low Emissions Factor	Median Emissions Factor	High Emissions Factor	Primary Energy Factor
Finished Motor Gasoline	46.46%	0.00	130 tons CO ₂ e / TJ Fuel Combusted	141 tons CO ₂ e / TJ Fuel Combusted	150 tons CO ₂ e / TJ Fuel Combusted	1.187
Distillate Fuel Oil	17.92%	0.50	135 tons CO ₂ e / TJ Fuel Combusted	138 tons CO ₂ e / TJ Fuel Combusted	147 tons CO ₂ e / TJ Fuel Combusted	1.158
Kerosene	7.51%	0.00	130 tons CO ₂ e / TJ Fuel Combusted	135 tons CO ₂ e / TJ Fuel Combusted	139 tons CO ₂ e / TJ Fuel Combusted	1.205
Liquefied Petroleum Gases	12.75%	0.59	121 tons CO ₂ e / TJ Fuel Combusted	135 tons CO ₂ e / TJ Fuel Combusted	153 tons CO ₂ e / TJ Fuel Combusted	1.151
Petroleum Coke	1.87%	0.30	197 tons CO ₂ e / TJ Fuel Combusted	221 tons CO ₂ e / TJ Fuel Combusted	245 tons CO ₂ e / TJ Fuel Combusted	1.048
Still Gas	3.72%	0.59	118 tons CO ₂ e / TJ Fuel Combusted	133 tons CO ₂ e / TJ Fuel Combusted	153 tons CO ₂ e / TJ Fuel Combusted	1.092
Residual Fuel Oil	1.70%	0.00	133 tons CO ₂ e / TJ Fuel Combusted	146 tons CO ₂ e / TJ Fuel Combusted	168 tons CO ₂ e / TJ Fuel Combusted	1.191
Asphalt*	1.71%	1.00		--		--
Other Oils*	0.56%	1.00		--		--
Lubricants*	0.64%	1.00		--		--
Other*	5.16%	1.00		--		--

Table A17. Tar sands end-use products and factors

Tar Sands End-use Product	Proportion of Resource Used as Input for End-use Product	Carbon Storage Factor	Low Emissions Factor	Median Emissions Factor	High Emissions Factor	Primary Energy Factor
Finished Motor Gasoline	46.46%	0.00	106 tons CO ₂ e / TJ Fuel Combusted	106 tons CO ₂ e / TJ Fuel Combusted	106 tons CO ₂ e / TJ Fuel Combusted	1.187
Distillate Fuel Oil	17.92%	0.50	105 tons CO ₂ e / TJ Fuel Combusted	105 tons CO ₂ e / TJ Fuel Combusted	105 tons CO ₂ e / TJ Fuel Combusted	1.158
Kerosene	7.51%	0.00	96 tons CO ₂ e / TJ Fuel Combusted	102 tons CO ₂ e / TJ Fuel Combusted	110 tons CO ₂ e / TJ Fuel Combusted	1.205
Liquefied Petroleum Gases	12.75%	0.59	102 tons CO ₂ e / TJ Fuel Combusted	102 tons CO ₂ e / TJ Fuel Combusted	102 tons CO ₂ e / TJ Fuel Combusted	1.151
Petroleum Coke	1.87%	0.30	156 tons CO ₂ e / TJ Fuel Combusted	167 tons CO ₂ e / TJ Fuel Combusted	176 tons CO ₂ e / TJ Fuel Combusted	1.048
Still Gas	3.72%	0.59	93 tons CO ₂ e / TJ Fuel Combusted	101 tons CO ₂ e / TJ Fuel Combusted	110 tons CO ₂ e / TJ Fuel Combusted	1.092
Residual Fuel Oil	1.70%	0.00	105 tons CO ₂ e / TJ Fuel Combusted	146 tons CO ₂ e / TJ Fuel Combusted	121 tons CO ₂ e / TJ Fuel Combusted	1.191
Asphalt*	1.71%	1.00		--		--
Other Oils*	0.56%	1.00		--		--
Lubricants*	0.64%	1.00		--		--
Other*	5.16%	1.00		--		--

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End Notes

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- ⁶ Ibid at ES-4. Carbon dioxide equivalent (CO₂e) is the standard measure of greenhouse gas emissions. The measure accounts for the different global warming potentials for different greenhouse gases such as N₂O, CH₄, and CO₂.
- ⁷ Climate Action Tracker is a joint project of Climate Analytics, Ecofys, Potsdam Institute for Climate Impact Research, and the NewClimate Institute.
- ⁸ Climate Action Tracker. 2015. Are governments doing their “fair share”? New method assesses climate action. 27 March 2015. See Figures 2 and 3.
- ⁹ Stratus Consulting. 2014. Greenhouse Gas Emissions from Fossil Energy Extracted from Federal Lands and Waters. Available at: <http://wilderness.org/sites/default/files/FINAL%20STRATUS%20REPORT.pdf>
- ¹⁰ Heede, Rick. 2015. Memorandum to Dunkiel Saunders and Friends of The Earth. Climate Accountability Institute. Available at: http://webiva-downton.s3.amazonaws.com/877/3a/7/5721/Exhibit_1-1_ONRR_ProdEmissions_Heede_7May15.pdf
- ¹¹ A portion of unleased federal fossil fuel resources are precluded from future leasing by statutory restriction, such as being located within a designated wilderness area. These were accounted for by excluding categories 1 (no leasing by Executive Order) and 2 (no leasing by administrative reason) from Energy Policy and Conservation Lands (EPCA).
- ¹² U.S. Environmental Protection Agency. 2015. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2013. Available at: <http://www.epa.gov/climatechange/emissions/usinventoryreport.html>. ES-4.
- ¹³ Research by the World Resources Institute (WRI) 2013 and NREL (2014) suggest that there are no differences between shale and conventional natural gas based on meta-analyses of prior research, although NREL notes that better methane measurements are needed to improve the accuracy of upstream emissions and leakage issues with shale gas.
- ¹⁴ DOE/BLM 2012. United States Department of Energy, United States Department of the Interior, Bureau of Land Management. “Assessment of Plans and Progress on US Bureau of Land Management Oil Shale RD&D Leases in the United States.” http://energy.gov/sites/prod/files/2013/04/f0/BLM_Final.pdf
- ¹⁵ USGS 2006
- ¹⁶ BLM ROD 2013
- ¹⁷ AAPG 2013.
- ¹⁸ EIA 2014d
- ¹⁹ EIA 2013b.
- ²⁰ EIA 2014e.
- ²¹ Brandt, A. 2011. Upstream greenhouse gas (GHG) emissions from Canadian oil sands as a feedstock for European refineries. Report, January 18, 2011.
- ²² Deru and Torcellini’s 2007 technical paper Source Energy and Emission Factors for Energy Use in Buildings.
- ²³ EIA 2015b.
- ²⁴ EIA 2015b.
- ²⁵ EIA 2014e.
- ²⁶ Deru and Torcellini, 2007.
- ²⁷ Deru and Torcellini, 2007.
- ²⁸ Herweyer and Gupta, 2008.
- ²⁹ This is the average of Jacobs 2009, TIAX 2009, and NETL 2008.
- ³⁰ Burnham, et al. 2012.
- ³¹ This is the average of Jacobs 2009, TIAX 2009, and NETL 2008, 2009.
- ³² NETL 2008, 2009
- ³³ NETL 2008, 2009
- ³⁴ NETL 2008, 2009.
- ³⁵ EIA, 2014a.
- ³⁶ Burnham et al., 2012.
- ³⁷ EPA, 2015.
- ³⁸ Johnson, 2010.

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Subject: comments on Continental Divide-Creston Final EIS
Date: Monday, May 16, 2016 1:32:51 PM
Attachments: [TWS et al. comments on CD-C FEIS - 5-16-16.pdf](#)
[TWS et al. comments on CD-C FEIS-Exhibit 1.pdf](#)
[TWS et al. comments on CD-C FEIS-Exhibit 1.pdf](#)
[TWS et al. comments on CD-C FEIS-Exhibit 2.pdf](#)

Dear Ms. Fleuret – Attached please find comments from The Wilderness Society, Wyoming Outdoor Council and National Audubon Society on the Final EIS, along with the referenced attachments. Thank you for considering our comments.

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The Wilderness Society • Wyoming Outdoor Council • National Audubon Society

May 16, 2016

Bureau of Land Management
Continental Divide-Creston Project Final EIS
c/o Jennifer Fleuret
1300 North Third Street
Rawlins, WY 82301
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Re: Comments on the Final Environmental Impact Statement Continental Divide-Creston Natural Gas Development Project

Dear Ms. Fleuret:

Please accept these comments from the National Audubon Society, Wyoming Outdoor Council and The Wilderness society regarding the above referenced environmental impact statement that has been developed by the Bureau of Land Management (BLM). We appreciate the opportunity to comment on this final environmental impact statement, recognizing that BLM has discretion to seek comments at this stage of the process, and are submitting these comments because we believe the project approval can and should be improved.

The National Audubon Society's mission is to conserve and restore natural ecosystems, focusing on birds, other wildlife, and their habitats for the benefit of humanity and the earth's biological diversity. Established in 1967, the Wyoming Outdoor Council is the state's oldest independent conservation organization. Our mission is to protect Wyoming's environment and quality of life for present and future generations. The mission of the Wilderness Society is to protect wilderness and inspire Americans to care for our wild places.

In these comments we will focus on issues related to Greater sage-grouse conservation, the need for openness and transparency in the implementation and mitigation of this project, air quality issues, and concerns about the proposed level of development the BLM is planning to permit. Henceforth we will refer to the final environmental impact statement (FEIS) that has been prepared for the Continental Divide-Creston (CD-C) Project Area and Project using those acronyms.

Overview of Key Recommendations:

1. Management of greater sage-grouse needs to be strengthened to limit surface disturbance, enhance mitigation requirements and incorporate noise protections based on best available science.

2. Both subsequent development approvals and implementation of mitigation must be transparent and provide meaningful opportunities for public engagement.
3. Air quality protection should include leak detection and repair requirements.
4. Proposed development levels must be reduced to reflect the BLM's obligations to protect other resources.

I. GREATER SAGE-GROUSE CONCERNS

Our groups have supported and continue to support the State of Wyoming and the BLM in the development and implementation of the sage-grouse core area strategy. This is a part of a first of its kind, landscape-level conservation effort that knits together local, state and federal perspectives, which many believe is the largest conservation effort in U.S. history, benefitting not only the greater sage-grouse, but also hundreds of other species and communities around the West. We support the strategy because we believe it can work to achieve the conservation of the sage-grouse in a way that allows continued human activity and uses on the landscape while protecting the habitat that is most important for the species. For the conservation strategy to work, however, it must be honored, respected, and faithfully implemented. Unfortunately, in our review of the CD-C FEIS, we see indications that the BLM may be backing away from some of the most fundamental elements of the strategy, and this concerns us.

Below we discuss relevant sections of the "9 Plan" that we expect to see incorporated into the Record of Decision (ROD) for the CD-C project and all subsequent site-specific approvals that are tiered to the FEIS and ROD. We encourage the BLM to pay careful attention to the implementation of these requirements, and ask it to do so in a manner that is open and transparent and that provides appropriate opportunities for public participation, consistent with the National Environmental Policy Act (NEPA) and the Department of the Interior's (DOI) landscape scale mitigation policy.

In its 2010 Endangered Species Act listing decision, the U.S. Fish and Wildlife Service (USFWS) determined that Factor A, the present or threatened destruction, modification, or curtailment of the habitat or range of the sage-grouse, and Factor D, the inadequacy of existing regulatory mechanisms, posed a significant threat to the sage-grouse now and in the foreseeable future. The USFWS identified the principal regulatory mechanisms for the BLM as conservation measures in resource management plans (RMP). A failure by the BLM to strictly adhere to the conservations measures outlined in its recently amended RMPs for sage-grouse conservation would cast doubt on the effectiveness of the "regulatory mechanisms" deemed essential to the conservation strategy, and would likely trigger a response from the USFWS that multiple stakeholders have worked hard to avoid.

A. Valid Existing Rights in Leased Areas Should Not Prevent Compliance with Density of Disturbance Limits.

The BLM appropriately notes the commitments made in connection with planning for conservation of the greater sage-grouse, stating: "[m]anagement of Greater sage-grouse within the CD-C project area **will conform** to the [Approved Resource Management Plan Amendments-ARMPA] and the ROD for the Greater Sage-Grouse." FEIS at 2-24 (emphasis added). A critical

provision of the ROD, and the companion Wyoming state policy, is that in priority habitat management areas (PHMA) or core areas, “the density of disturbance of an energy or mining facility will be limited to an average of one site per square mile (640 acres)” and the “proposed location and cumulative existing disturbances should not exceed 5 percent of suitable habitat.” FEIS at 2-25. The substantial diversion of the CD-C FEIS from these fundamental protections is a major concern, which can and should be addressed even in the context of existing leases.

The CD-C Plan makes clear that its directives are all “subject to valid existing rights.” It states that, “[a]cross all alternatives, valid existing rights would be honored” and appends this qualification to several specific resource protections. *See, e.g.*, FEIS at 2-18, 2-14 (“This alternative requires that all future natural gas wells on federal mineral estate be drilled from existing or new multi-well pads, which would require the employment of directional drilling technology, subject to valid existing rights.”), 2-25 (“Within PHMAs [Priority Habitat Management Areas]...the density of disturbance of an energy or mining facility would be limited...subject to valid existing rights.”).

Yet, the CD-C FEIS plan largely defers the analysis of how valid existing rights will be harmonized with the conservation goals and objectives of the Approved Resource Management Plan Amendment for Greater Sage-Grouse (Casper, Kemmerer, Newcastle, Pinedale, Rawlins, and Rock Springs Field Offices) (“9 Plan ARMPA”) until site-specific authorizations, like drilling permits, are proposed. This deferential, piecemeal approach to valid existing rights is inconsistent with key requirements and undermines the primary objective of the 9 Plan ARMPA: to manage and address threats to sage-grouse at the landscape-level. *See* 9 Plan ARMPA at 21 (“The plan provides consistent GRSG habitat management across the range, prioritizes development outside of GRSG habitat, and focuses on a landscape-scale approach to conserving GRSG habitat.”).

For instance, the 9 Plan ARMPA requires that the BLM “prioritize” oil and gas development “inside of non-habitat areas first and then in the least suitable habitat for GRSG.” 9 Plan ARMPA at 24. The fact that most or all of the CD-C Project Area is leased (encumbered by valid existing rights) does not relieve the BLM of this duty. In fact, the 9 Plan ARMPA specifically recognizes that the BLM “will work with project proponents holding valid existing leases that include less stringent lease stipulations . . . to ensure that measureable sage-grouse conservation objectives . . . are included in all project proposals.” *Id.* at 28. Yet beyond recognizing the general need to prioritize, the CD-C FEIS contains no detail on how that will be accomplished.

Under the 9 Plan ARMPA, the BLM must establish development priorities now, while evaluating impacts across a broad landscape, and in light of the specific habitat types and suitability found in the project area. The planning area contains a wide variety of sage-grouse habitat types—ranging from Sagebrush Focal Areas (SFA) to General Habitat Management Areas (GHMA) and PHMA—of varying suitability, at least based on the presence or absence of existing disturbance. FEIS at 2-5, 3-121-22. BLM cannot wait until the permitting stage to attempt to spell out how development will be prioritized across the broader landscape. It is too late, at that point, as industry and specific drilling proposals will determine priorities and not the landscape-level needs of sage-grouse, as envisioned by the 9 Plan ARMPA. This is just one specific

example of how the CD-C FEIS does not provide adequate guidance on how valid existing rights will be harmonized with the goals and objectives of the 9 Plan ARMPA.

Instead, the BLM should determine how to achieve its resource protection goals for the protection of sage-grouse in light of valid existing rights now, at the planning stage, rather than piecemeal, with each site-specific authorization. To do so, the plan established in the FEIS should begin by identifying sources of authority by which the BLM can condition development on existing oil and gas leases in the planning area, in accordance with the 9 Plan ARMPA. Some of these sources of authority include:

- The current BLM standard lease form, Form 3100-11, which is issued “subject to applicable laws, the terms conditions, and attached stipulations of this lease, the Secretary of the Interior’s regulations and formal orders in effect as of lease issuance, and to regulations and formal orders hereafter promulgated...” The lease reserves numerous rights to condition future development under “Lease Terms,” especially pursuant to sections 4 and 6. Section 4 of the standard lease gives the BLM the right to specify the rates of development and production on a lease “in the public interest,” and section 6 requires lease operations to be conducted so as to minimize adverse impacts and allows the BLM to specify reasonable measures for the conduct of operations to achieve that goal.
- WY BLM Information Notice (March 27, 2008) providing official notice to prospective lease bidders that BLM may impose restrictions on oil and gas operations to protect the Greater sage-grouse.
- The pre-Federal Land Policy and Management Act (FLPMA) oil and gas lease form, which provides that “this lease shall be subject to control in the public interest by the Secretary of the Interior...” See *National Wildlife Federation*, 169 IBLA 146, 164 (2006) (“With respect to the 1948 lease, BLM argues that regulatory provisions at 43 CFR 3162.1(a) and 43 CFR 3101.1-2 and applicable onshore oil and gas orders vest it with adequate authority to protect wildlife values. We agree.”)
- BLM regulations, which provide that BLM may impose “reasonable measures...to minimize adverse impacts to other resource values, land uses or users not addressed in the lease stipulations at the time operations are proposed.” 43 CFR § 3101.1-2. These reasonable measures, as well as the reasonable measures permitted under section 6 of the standard lease form, can include modifications to the siting or design of facilities, the timing of operations, and specification of reclamation measures. And both the Interior Board of Land Appeals (IBLA) and the BLM’s commentary in the Federal Register when this regulation was adopted have made it clear these reasonable measures are not limited to the “200-meter 60-day” limits mentioned in the regulation. See *Yates Petroleum Corp.*, 176 IBLA 144, 155-58 (2008); 53 Fed. Reg. 17,340, 17,341 (May 16, 1988) (finding that the ability to specify reasonable measures is expansive).

- FLPMA’s statutory mandate that “the Secretary shall, by regulation or otherwise, take any action necessary to prevent unnecessary or undue degradation of the lands.” 43 U.S.C. § 1732(b).
- Wyoming Executive Order 2008-2, first issued on August 1, 2008, and all subsequent updates, which impose stipulations including limits on density and disturbance from oil and gas activities inside core population areas (PHMA) for the conservation of sage-grouse.

Further, beyond the best management practices (BMP) and Required Design Features (RDF) identified in Appendix C of the FEIS, the plan in the FEIS should identify specific ways that the BLM can condition future development on existing leases to meet its resource protection goals for sage-grouse, including:¹

- Well siting, relocation, and timing authorities. *See* 43 CFR § 3101.1-2 (“*At a minimum*, measures shall be deemed consistent with lease rights granted provided they do not: require relocation of proposed operations by more than 200 meters; require that operations be sited off the leasehold; or prohibit new surface disturbing operations for a period in excess of 60 days in any lease year.”) (emphasis added); *see also Yates Petroleum Corp.*, 176 IBLA 144, 156 (2008) (stating that § 3101.1-2 “describes what measures ‘at a minimum’ are deemed consistent with lease rights, and does not purport to prohibit as unreasonable *per se* measures that are more stringent.”);
- Mitigation requirements. *See, e.g., Colorado Environmental Coalition*, 165 IBLA 221, 227 (2005) (“[The unnecessary or undue degradation] standard allows the Secretary to impose reasonable mitigating measures to protect environmental values on activities necessary to the exercise of valid existing rights.”);
- Lease suspensions. *See* 43 CFR § 3103.4-4 (“A suspension of operations and production may be directed or consented to by the authorized officer only in the interest of conservation of natural resources.”); *see also Copper Valley Mach. Works, Inc.*, 653 F.2d 595, 600 (D.C. Cir. 1981) (“...suspending operations to avoid environmental harm is definitely a suspension in the interest of conservation in the ordinary sense of the word.”);
- Unitization. Form 3100-11, § 4 (“Lessor reserves right to specify rates of development and production in the public interest and to require lessee to subscribe to a cooperative or unit plan...”). *See also* 30 U.S.C. § 226(m) and 43 C.F.R. Part 3180 (authorizing unit agreements); and
- Deferring or postponing new authorizations. *See* 9 Plan ARMPA at 2-5 (“Consider the likelihood of developing not-yet-constructed surface-disturbing activities, as defined in Table 2 of the Monitoring Framework, under valid existing rights before authorizing new projects

¹ BLM could also seek Solicitor assistance in identifying other applicable development conditions. *See also generally* Bruce M. Pendery, *BLM’s Retained Rights: How Requiring Environmental Protection Fulfills Oil and Gas Lease Obligations*, 40 *Envtl. L.* 599 (2010).

in PHMAs.”)

The plan in the FEIS should identify how these protective measures can be applied to valid existing rights to meet critical resource protection goals, especially for sage-grouse. For example, the Plan recognizes that valid existing rights could compromise its density and disturbance caps in sage-grouse PHMA. FEIS at 4-126 (“...the CD-C project area already has existing disturbances within delineated PHMAs...As CD-C Operators propose projects within this area, the DDCT analysis tool may demonstrate exceedances of the disturbance and disruption limitations because of existing disturbance.”). Yet, to prepare for these exceedances, the FEIS plan only generally provides that:

[T]he preferred options when dealing with threshold exceedance in a PHMA are to defer actions until the disturbance has been reduced below the threshold, to redesign the project so it does not result in any additional surface disturbance (collocation), or to redesign the project to move it outside of PHMA. If the proposal is based on a valid existing right, the BLM would work with the project proponents to avoid, reduce and mitigate adverse impacts to the extent compatible with lessees’ rights to drill and produce fluid mineral resources.

FEIS at p. 4-126.

Instead, the Plan should identify specific conditions of approval by which BLM can meet the density and disturbance caps for sage-grouse, consistent with, and tailored to, the valid existing rights in PHMA. To “defer actions until the disturbance has been reduced below the threshold,” for example, the Plan should suggest that BLM defer drilling permits and/or authorize oil and gas lease suspensions. *See* 43 CFR § 3103.4-4 (allowing lease suspensions to be directed). Likewise, “to redesign the project so it does not result in additional surface disturbance (collocation),” the Plan should suggest that BLM require unitization for leases accessing common reservoirs. *See* BLM Form 3100-11, § 4 (reserving the right to the BLM to “require” lessees to subscribe to a cooperative or unit plan). Or, “to redesign the project to move it outside of PHMA,” the Plan should suggest that BLM apply its well siting and relocation authorities. *See* 43 CFR § 3101.1-2 (allowing for reasonable measures to be specified). These are just some specific options BLM could employ, consistent with valid existing rights, to meet this critical resource protection need for sage-grouse, and which the BLM should identify in the CD-C FEIS plan.²

Moreover, while we believe BLM has ample authority to impose these conditions, should BLM take the position that a valid existing right on a lease will prevent it from meeting the 9 Plan ARMPA density of disturbance limits, then the agency should provide its justification for public comment prior to making a final decision. As we indicated in the introduction to this section, we believe the 9 Plan ARMPA should be faithfully implemented.

²The BLM is also required to consider “the potential for developing valid existing rights when authorizing new projects in PHMA.” ROD and ARMPA/ARMPs for the Rocky Mountain Region (September 2015) at 1-18, 2-5 (“Consider the likelihood of developing not-yet-constructed surface-disturbing activities...under valid existing rights before authorizing new projects in PHMAs.”). Like the protective measures that BLM should apply to valid existing rights to meet its resource protection goals, this requirement should also be explicit in the CD-C FEIS plan.

One reason for the need for increased specificity about managing development where there are valid existing lease rights is that BLM's preferred alternative specified in the CD-C FEIS, Alternative F, would allow 8 well pads to be developed in *every* BLM-owned section of land in the CD-C project area – a major exceedance from the provisions in the 9-Plan ARMPA limiting disturbance to one facility per square mile and five percent of suitable habitat. This means that up to 7,840 well pads could be developed on the 980 sections of BLM-owned land in the CD-C Project area, many of which are in sage-grouse PHMA. And in fact, the BLM's preferred alternative allows for exceptions that would permit even more than 8 well pads to be developed per section. Allowing 8 well pads in a section that falls in a sage-grouse PHMA is a significant failure to comply with the density of disturbance limits specified in the ARMPA. But as we have discussed, we do not believe the “subject to valid existing rights” provision must be a bar to complying with the surface disturbance limitations in the ARMPA.

B. Proposed Landscape Scale Mitigation Must Be Strengthened to Address Affected Resources and Comply with Applicable Policy.

Appendix S of the CD-C FEIS describes landscape scale mitigation measures that are planned in the CD-C Project Area. These measures apply especially to conservation needs for mule deer, pronghorn, and sage-grouse. As discussed in section II of these comments, Appendix S, like many other aspects of the CD-C FEIS, lacks transparency and opportunities for public participation, which must be corrected. Following are additional specific concerns regarding the landscape scale mitigation plan described in Appendix S.

1. Potential mitigation areas should be carefully evaluated.

Many offsite mitigation areas identified in Appendix G, which are incorporated into Appendix S, are located in existing oil and gas fields. Obviously, this raises concerns and questions about suitability, durability and effectiveness of mitigation proposed in these areas. Appendix G states:

It is important to note that our site-selection exercise did not account for future oil and gas development potential. Many proposed offset sites are within the Atlantic Rim or Desolation Flats Natural Gas Fields, and therefore may be unsuitable because of future development potential (Map F-3). Prior to establishing sites for actual mitigation offsets, the development potential should be carefully evaluated and incorporated into the decision-making process.

Appendix G at 5.

We understand that thresholds established by the BLM for mule deer and sage-grouse in the Atlantic Rim project area have already been exceeded, which would mean that compensatory mitigation for impacts to mule deer and sage-grouse in the CD-C project area cannot be achieved in the Atlantic Rim area. Therefore, these areas should not be recognized as potential compensatory mitigation areas for development in the CD-C Project Area.

Other potential offsite mitigation areas identified in Appendix G may be encumbered by existing oil and gas leases, mining claims, mineral leases, ROWs, and other authorizations that could undermine or interfere with mitigation success. Again, this raises concerns about the suitability, durability and effectiveness of any mitigation project in these areas.

To address these concerns, we recommend that all of the potential off-site mitigation sites identified in Appendix G be analyzed in a NEPA or other public planning document to determine their feasibility for use as compensatory mitigation sites. Landscape scale mitigation requires a landscape scale approach. This cannot be accomplished through an ad hoc, well-by-well review based on limited about the suitability of sites for compensatory mitigation. We also encourage the BLM to investigate potential opportunities for compensatory mitigation *within* the 1 million acre project area. For example, protecting the integrity of a wildlife migration corridor or important sage-grouse habitat inside the project area could compensate for or offset impacts to those resources caused by both existing and proposed activities in other areas of the field.

2. Compensatory mitigation should be identified for additional resources that will be impacted by the project.

Appendix S concludes that compensatory mitigation is needed for only three species of wildlife: pronghorn antelope, mule deer and sage-grouse. Apparently, the BLM believes that impacts to *all* other natural resources (including air, soils, recreation, wildlife habitat, and water) would be avoided or minimized to a degree that avoids a need to compensate for the loss or impact. However, with nearly 9,000 new wells proposed on up to eight well pads per section in a vast area that already has 4,700 wells, it seems improbable that there will be no need for compensatory mitigation for other resources besides the three identified above.

It is unclear, for example, what mitigation measure or set of measures will achieve a no net loss standard. Appendix G defines no net loss as “when mitigation results in no negative change to baseline conditions (e.g. fully offset or balanced).” The construction and regular use of an extensive industrial road network in an area that currently lacks roads (the baseline condition) creates an impact to open space, to wildlife and wildlife habitat, and to recreation and visitor experiences. The avoidance and mitigation measures proposed in the FEIS do not remove the road network or well pads and industrial facilities from the landscape. There is still a significant change to baseline conditions. To achieve the no net loss standard requires the BLM to find a way to “offset or balance” the impact of the road network with mitigation somewhere else, perhaps by not developing a comparable area within the project site that might otherwise be developed.

The mitigation standards discussed in the FEIS, particularly in Appendix S, may not align with the standards and requirements outlined in the President’s November 3, 2015, mitigation memorandum. This memo provides in section 3(b) that:

Agencies' mitigation policies should establish a net benefit goal or, at a minimum, a no net loss goal for natural resources the agency manages that are important, scarce, or sensitive, or wherever doing so is consistent with agency mission and established natural resource objectives. When a resource's value is determined to

be irreplaceable, the preferred means of achieving either of these goals is through avoidance, consistent with applicable legal authorities. Agencies should explicitly consider the extent to which the beneficial environmental outcomes that will be achieved are demonstrably new and would not have occurred in the absence of mitigation (i.e. additionality) when determining whether those measures adequately address impacts to natural resources.

Based on this provision, we suggest that all sensitive species in the project area should be subject to a “net benefit goal” mitigation standard in all areas (not just in sage-grouse PHMA). And species such as the Wyoming pocket gopher and sage-grouse are so rare they should be considered “irreplaceable” and thus the mitigation standard should be avoidance in order to comply with the President’s memorandum.³

The President’s memo also contains this provision in section 1:

It shall be the policy of [the Department of the Interior] and all bureaus and agencies . . . to avoid and then minimize harmful effects to land, water, wildlife, and other ecological resources . . . caused by land- or water-disturbing activities, and to ensure that any remaining harmful effects are effectively addressed, consistent with existing mission and legal authorities.

So again, avoidance and minimization of impacts should be the priority in the CD-C FEIS. The BLM should ensure that this hierarchy of mitigation—first avoidance, then minimization, and last compensatory mitigation—is recognized in the CD-C FEIS. The authorization for up to eight wells per section under the preferred alternative seems to suggest that avoidance of impacts was not given sufficient attention in the FEIS.

In Appendix S, the BLM appears to limit the application of appropriate mitigation goals by confining itself only to resource values identified in the Rawlins RMP as worthy of compensatory mitigation. As noted earlier, the resources are limited to three wildlife species and *no other resource values*:

“Mitigation standard: a component of a land use plan’s resource objective that describes the extent to which mitigation will be applied (e.g. net gain, no net loss, net loss).”

FEIS Appendix S at 25.

At a minimum, however, the President’s memorandum calls for no net loss of land, water, wildlife and other ecological resources from federal actions or permitting. The BLM should ensure compliance with the President’s memo in the CD-C FEIS ROD. The Rawlins RMP also must be interpreted in compliance with this memorandum.

³ As stated in Section 1 of the President’s memo, “existing legal authorities contain additional protections for some resources that are of such irreplaceable character that minimization and compensation measures, while potentially practicable, may not be adequate or appropriate, and therefore agencies should design policies to promote avoidance of impacts to these resources.”

Because the FEIS does not identify or classify resources in a way that aligns with the President’s mitigation memo (i.e., important, scarce, sensitive, or irreplaceable resources should receive priority), it therefore fails to assign appropriate mitigation standards to resources in the project area. We recommend that this issue be addressed and corrected in the ROD, particularly relative to protection of sage-grouse.

The most striking aspect of this FEIS in general, and Appendix S in particular, is the failure to explain how the project, overall, will achieve a no net loss mitigation standard in the project area along with a net conservation gain standard inside designated sage-grouse PHMA. Large areas of public lands that today exist in relatively natural conditions will be roaded, fragmented, and industrialized by this massive project. To varying degrees, the mitigation proposed in the FEIS will avoid and reduce some of the impacts, but if this project is fully built, it is likely the nation’s largest onshore oil and gas project will be established in this area. The BLM must offset, balance, and compensate for this impact. Compounding the problem, the BLM cannot achieve landscape-scale mitigation goals on a piecemeal, project-by-project, approval-by-approval basis.

3. Approved development levels undercut the agency’s ability to achieve mitigation goals.

Finally, we are concerned that the BLM may not be able to perform the significant work and support activities that will be required to implement Appendix S if the 600 wells BLM is planning to allow are drilled each year. It will take a tremendous amount of work to meet the requirements in Appendix S to identify baseline conditions and trends, assess the specified attributes (soil/site stability, hydraulic function, and biotic function), conduct the detailed debit calculations, and then identify compensatory mitigation measures and mitigation sites. The BLM must ensure that the measures specified in Appendix S can actually be accomplished if the CD-C project is developed at the level contemplated; as discussed throughout these comments, however, BLM should not permit development at the proposed level.

C. Noise Protections Related to Sage-Grouse Should Reflect the Best Available Science

According to the CD-C FEIS, “[n]oise levels interfere with bird communication during mating periods resulting in lower bird attendance at leks. “ FEIS at 4-124. To mitigate this impact, the FEIS includes the following conservation measure: “[n]ew project noise levels should not exceed 10 dBA above baseline noise at the perimeter of the lek from 6:00 pm to 8:00 am during the breeding season (April 1–May 15).” FEIS 4-125.

In addition, the conservation and mitigation measures contained in Appendix C for the control of noise impacts describe measures that will be required by the BLM to reduce noise impacts:

1. Limit noise to less than 10 decibels above ambient measures (20-24 dBA) at sunrise at the perimeter of a lek during active lek season (Patricelli et al. 2010, Blickley et al. 2012).
2. Require noise shields when drilling during the lek, nesting, brood-rearing, or wintering season.

3. Locate new compressor stations outside priority habitats and design them to reduce noise that may be directed towards priority habitat.

FEIS at C-35.

The key conservation measure outlined in the CD-C FEIS to reduce noise impacts to sage-grouse—limiting noise at the lek during the breeding period to no more than 10 dBA above baseline from 6 pm to 8 am—is not consistent with the best available science and therefore fails to achieve the intended conservation objective of the ARMPA. These conservation measures, therefore, cannot be relied upon to reduce the impact of noise to a level that falls below the significance threshold identified in the FEIS. FEIS at 4-118. Thus, with respect to the impacts of noise on sage-grouse, the following statement in the FEIS is not correct: “The development of the CD-C project would be done in accordance with the ARMPA and the SGEO and those strategies have been found to provide sufficient regulatory mechanisms for the conservation of Greater Sage-Grouse.” FEIS at 4-144.

A recent (May 11, 2016) analysis by Ambrose, Patricelli and Copeland of noise provisions in Wyoming BLM’s Approved RMP Amendments show that BLM’s current noise protocols fail to reflect best available science; mischaracterize baseline ambient noise levels in typical sage-grouse habitat throughout rural Wyoming; and fail to provide an adequate level of protection for the sage-grouse. The Ambrose analysis, entitled *Review of Noise Protocols for Sage-Grouse*, is appended as Exhibit 1 and a work cited therein is included as Exhibit 1 supp.

According to these experts, the correct ambient baseline noise level in typical sage-grouse habitat in Wyoming is much lower than the 20-25 dBA values reported in the CD-C FEIS:

However, while the use of a fixed ambient value is a critical improvement over the use of measured baseline values, **using 20-24 dB is inappropriate as a measure of ambient noise**. Neither of the two papers cited in the rule, Patricelli et al. 2010 or Blickley et al. 2012, provide any justification for these ambient values. Neither of these papers report ambient values for representative areas during the lekking period. A more recent, peer-reviewed article suggests 16-20 dBA as appropriate ambient levels for sage-grouse habitat (Patricelli et al. 2013).

Exhibit 1 at 2 (emphasis in original).

The BLM must take note of the statement, above: “Neither of the two papers cited in the rule, Patricelli et al. 2010 or Blickley et al. 2012, provide any justification for these ambient values. Neither of these papers report ambient values for representative areas during the lekking period.” The absence of the best available science to support a 20-24 dBA ambient value undermines the validity of its use as a baseline for purposes of CD-C project implementation.

First, relying on best available science, Ambrose, Patricelli and Copeland recommend using 16 dBA as a “fixed baseline”:

Based on the Ambrose 2013 and 2014a studies, the ambient noise levels in typical sage-grouse habitat in Wyoming (and likely rangewide) are 14-17 dBA or less. **For the purposes of establishing noise stipulations relative to greater sage-grouse, we recommend using a fixed ambient of 16 dBA as a baseline; this is consistent with a peer-reviewed publication (Patricelli et al. 2013) and widely-used reports (e.g. EPA 1971).** Allowing 10 dB of noise from new projects, this leads to an allowable level of 26 dBA.

Exhibit 1 at 2 (emphasis provided in the original).

Second, the authors recommend using 26 dBA as a threshold for noise exposure: “For the purposes of assessing acoustic impacts to greater sage-grouse, we recommend using 26 dBA as the threshold for noise exposure (ambient 16 dBA + 10 dBA).” Exhibit 1 at 3. As reported by these experts, there is ample evidence to suggest that noise levels in excess of 26 dBA are harmful to sage-grouse. The other reason for establishing a threshold of 26 dBA is to address the problem of escalating baselines—incremental increases in noise exposure—which happens when the sounds of existing oil and gas development are considered to be part of the ambient baseline. The authors describe this phenomenon on page 5 of their report and stress that: “The inclusion of existing noise into ambient values clearly does not protect greater sage-grouse.” *Id.* at 5

Third, Ambrose, et al., recommend that: “In situations where existing noise levels at leks exceed 26 dBA before project initiation, new projects should not contribute to an increase in sound levels at leks; this can be accomplished through noise mitigation measures, such as pad siting and technology that limits the combined noise exposure.” Exhibit 1 at 4. Specifically, the authors state that:

There may be situations where sound levels at leks exceed an L50 of 26 dBA before project initiation due to existing noise sources, though recent data suggest that this is unlikely outside of heavily developed areas (Ambrose et al. 2014a and 2014b). In these cases, the best available evidence suggests that additional noise will increase the impact on these leks, as sage-grouse do not adapt to the presence of noise over time (as discussed below; Patricelli et al. 2013). Therefore, to limit impacts on sage grouse, new projects should not contribute to an increase in sound levels at leks already exceeding the noise limits. This rule would not preclude further development at sites that already have sources exceeding 26 dBA due to the non-additive way that multiple sound sources combine to determine overall noise levels. For example, a new source with an L50 9 dB quieter than the L50 of an existing source at the measurement site would add only 0.5 dB to the total noise exposure. Therefore new projects could proceed by increasing the distance to the lek or through the use of noise-mitigation technology.

Id.

Because the CD-C is an infill project, the recommendations above may be particularly important to understand and implement, and we encourage the BLM to heed the advice of these

scientists: “Therefore, to limit impacts on sage grouse, new projects should not contribute to an increase in sound levels at leks already exceeding the noise limits.” *Id.*

Fourth, the scientists recommend that, outside of lekking hours during the breeding season, reasonable efforts should be made to keep noise as close to these limits as possible:

Maintaining lek activity involves males and females foraging, roosting, nesting and brood-rearing before and after lekking times on a daily and seasonal basis, and noise impacts may also occur during these off-lek activities (e.g. Vehrencamp et al. 1989; Wallestad and Schladweiler 1974; Schoenberg 1982; Patricelli et al. 2013). Therefore, outside of lekking hours during the breeding season, reasonable efforts should be made to keep noise as close to these limits as possible.

Exhibit 1 at 4.

Finally, the authors describe and recommend scientifically defensible procedures for assessing compliance with noise protocols. We urge BLM to adopt these recommendations in the CD-C ROD. Exhibit 1 at 4.

For the reasons described in detail in the analysis by Ambrose, et al, we recommend that:

1. The CD-C ROD establish a field-wide, fixed ambient baseline value of 16 dBA;
2. The CD-C ROD limit total noise at the perimeter of occupied leks to 26 dBA (16 dBA + 10 dBA);
3. The CD-C ROD extend coverage of the noise limits by one hour, to 9 am, to protect more of the male display period; and
4. All other noise reductions strategies are implemented in the CD-C project area to reduce noise impacts to sage-grouse.

The BLM made a firm commitment in its plan to conserve the greater sage-grouse and to use best available science. The CD-C project analysis prepared by the BLM provides an opportunity to honor that commitment:

Continued Commitment to Research and Use of Best Available Science—
Through implementation of this strategy, new management issues and questions are likely to arise that may warrant additional guidance or study by technical experts, scientists, and researchers. The BLM is committed to continue working with individuals and institutions with expertise in relevant fields in order to ensure that land and resource management affecting conservation of the GRS and the sagebrush ecosystem continues to be guided by sound peer-reviewed research and the best available science.

See ROD and ARMPAs/ARMPs for the Rocky Mountain GRSG Sub-Regions September 2015, at 1-40.

Echoing and underscoring that commitment, the Management Objectives contained in the Approved RMP Amendments for sage-grouse state that: “[e]ffects of infrastructure projects, including siting, will be minimized using the best available science, updated as monitoring information on current infrastructure projects becomes available.” See ARMPA for Greater Sage-Grouse (September 2015) Management Objective 17, at 24.

Accordingly, the recommendations provided by Ambrose, Patricelli and Copeland, which represent the best available science, should be adopted in the CD-C ROD and applied in the CD-C Project Area.

II. THERE IS A NEED FOR IMPROVED TRANSPARENCY FOR IMPLEMENTATION OF THE CD-C PROJECT

The CD-C FEIS will likely be followed by a ROD that authorizes nearly 9,000 wells in addition to the 4,700 wells previously approved, making the CD-C project the largest onshore oil and gas project on the public lands. Under the preferred alternative, Alternative F, the BLM may authorize up to 600 wells per year on as many as eight well pads per section. FEIS at 2-1, 2-18. Specific locations of the 8,950 wells, and their well pads, access roads, compressor stations, waste disposal facilities, injection wells, pipelines, gravel quarries, man camps, and related “ancillary facilities” are unknown. Instead, these features—and their environmental impacts—will be analyzed in site-specific environmental assessments (EA) prepared by the Rawlins Field Office. It appears there will be a single EA prepared for each APD, up to 600 per year. Thus, under existing procedures, BLM personnel in the Rawlins Field Office will evaluate and authorize up to 600 wells and related facilities in as many as 600 separate EAs on an annual basis. Most importantly, these will be so-called internal EAs for which public comment is neither accepted nor requested by the BLM. This approach fails to ensure needed openness, transparency, and public participation opportunities that should accompany implementation of the CD-C FEIS.

To ensure a transparent, robust and scientifically defensible environmental review process, EAs prepared for APDs and ROWs should be made available for public review and comment prior to approval. The use of Programmatic EAs available for public review and comment prior to final decisions for groups of wells (for example, by watershed, or operator, or location) should be required. We note that the Atlantic Rim Project allows for “bundling” of wells for NEPA review, which provides a model for this. Spatial data relative to wells considered in bundles for APD or ROW approval should be made available to the public on e-planning websites.

To further enhance transparency, the APDs themselves should be posted on BLM’s website. The public should not be expected or required to physically travel to Rawlins in order to review operators’ drilling and surface use plans.

It is critically important for the BLM to ensure and provide for openness, transparency and opportunities for public participation in the development of America's largest onshore oil and natural gas project on the public lands. To achieve this goal, we suggest (in addition to an open and transparent NEPA process) the following: all written reports, plans and updates required by the ROD should be made available to the public without the need for a Freedom of Information Act request.

The FEIS contains several appendices that require operators to submit written reports and updates to BLM.⁴ These plans, and all associated reports, including the BLM-prepared "effectiveness reports" (Appendix I), "operational updates" (Appendix N), bi-annual reports (Appendix R), and mitigation, monitoring and adaptive management plans (Appendix S) should be readily available to the public by publication on the BLM's website.

Similarly, all meetings of groups or teams established in the ROD, such as the "CD-C discussion group", the "transportation planning committee," and the "CDC consultation group," should be open to the public and properly noticed at least 30 days in advance of such meetings.

We are most concerned about the lack of transparency displayed in Appendix S in the FEIS—Landscape Scale Mitigation. Public review is especially important regarding determinations of "no net loss," "net conservation gain" and compensatory mitigation. As discussed above, there are transparency requirements in the President's mitigation memorandum and the DOI's mitigation policy that must be complied with relative to these requirements.

To aid the process of developing effective mitigation, the BLM has proposed the creation of a CD-C discussion group. FEIS at S-19. Absent from the membership of the CD-C discussion group are environmental, conservation and other non-governmental organizations (NGO) with expertise and interest in mitigation. There is no mechanism to ensure that the "discussion group" operates in a transparent and open manner, yet this group would play a critical role in the process of developing and implementing mitigation: "The CD-C discussion group would need to create and add to/refine a list of projects/mitigation mechanisms that could be implemented as compensatory mitigation measures for residual impacts to Greater Sage-Grouse, pronghorn antelope, and mule deer as a result of development of the CD-C field." FEIS at S-19.

To correct these problems we request that 1) the membership on the group be expanded to include representatives from the conservation community; 2) that all meetings and conference calls of the CD-C discussion group be open to the public and properly noticed at least 30 days in advance; and 3) that the BLM, with assistance from the Solicitor's office, review the proposed function and activities of the CD-C discussion group for compliance with the Federal Advisory Committee Act (FACA).

The BLM must ensure openness, public participation, and transparency in the development of mitigation plans. As written, Appendix S fails to do so. In light of the above, we recommend that Appendix S be revised to include strong and clear language ensuring that

⁴ These include Appendices E, I, O, N, R, and S.

openness, transparency and opportunities for public participation are built into the process outlined in Appendix S. This is especially important for projects proposed in sage-grouse core areas because of the requirement to achieve a net conservation gain and the possibility of compensatory mitigation being required, both of which must be open, transparent and subject to public review and comment.

III. AIR QUALITY PROTECTION IN THE CD-C PROJECT AREA SHOULD INCLUDE LEAK DETECTION AND REPAIR REQUIREMENTS

We strongly urge the BLM to implement a quarterly, instrument-based leak detection and repair (LDAR) program in the CD-C Project Area. As the BLM is aware, the Environmental Protection Agency (EPA) lowered its national ambient air quality standard (NAAQS) for ozone in 2015 from 75 parts per billion (ppb) to a more protective 70 ppb. This new NAAQS emphasizes the need for LDAR.

According to the FEIS, based on a 3-year average, ozone concentrations would be in compliance with the NAAQS, but “ozone concentrations could exceed the level of the NAAQS during a single year.” FEIS at 2-30 (Table 2.4-2). The BLM also states in the FEIS that maximum 1-hour nitrogen dioxide (NO₂) impacts from drilling activities could exceed the 1-hour standard during the years when drilling occurs. However, the BLM assumes that they “would not result in a violation of the NAAQS or the companion Wyoming Ambient Air Quality Standard (WAAQS) since the standards are based on a 3-year average and drilling would not occur at the same location for a 3-year duration.” However, activity anywhere within the CD-C Project Area could impact the same area where air quality is of concern, whether or not a well is being drilled on a given pad for 3 years. Also important is that while the BLM’s modeling suggests that based on a 3- year average there would be no exceedance of the new ozone NAAQS under the preferred alternative (or any alternative), even an exceedance within a one-year period carries potential for short term environmental and/or health impacts.

Ozone is an incredibly harmful pollutant that causes both immediate and long-term health effects in humans.⁵ Exposure to ambient levels of ozone can lead to premature death in children and elderly adults. Ozone exposure can harm child development and adult reproductive health as well as lead to respiratory and cardiovascular impairments—in particular in young children and the elderly, but also in healthy adults especially those who engage in outdoor physical activity.

Given the harmful environmental and health implications of ozone pollution, we urge the BLM to require measures to cull ozone precursor emissions even where the state’s current requirements in the Concentrated Development Area (CDA) do not apply. In particular, we strongly urge the BLM to consider the implementation of a quarterly, instrument-based LDAR program. The CD-C FEIS does not currently propose LDAR requirements to detect and repair fugitive emissions leaks, but there are several reasons why the BLM should incorporate an LDAR requirement into the ROD:

⁵ American Lung Association. <http://www.lung.org/our-initiatives/healthy-air/outdoor/air-pollution/ozone.html>.

- 1) Scientific studies suggest oil and gas emissions are higher than inventory estimates primarily due to avoidable fugitive emissions.

There is growing scientific consensus demonstrating that actual oil and gas emissions are higher than inventory estimates. This is primarily due to the fact that equipment malfunctions, avoidable operating conditions, and poor maintenance at a small number of sites leads to significant excess emissions. Importantly, the nature of these excess emission events are random and unpredictable. As a result, the scientific studies strongly support frequent inspections using modern leak detection technology to identify malfunctioning or defective equipment that can lead to leaks at the maximum number of sites possible as well as the installation of robust pollution controls.

The first of these studies, conducted by an independent team of scientists at the University of Texas, found that emissions from equipment leaks, pneumatic controllers, and chemical injection pumps were 38 percent, 63 percent, and 100 percent higher, respectively, than is estimated in national inventories. This study also found that 5 percent of the facilities were responsible for 27 percent of the emissions.

Two follow-up studies focusing specifically on emissions from pneumatic controllers and liquids unloading activities at wells found similar results. Specifically, the studies found that 19 percent of the pneumatic devices accounted for 95 percent of the emissions from the devices tested, and about 20 percent of the wells with unloading emissions accounted for 65 to 83 percent of those emissions. The average methane emissions per pneumatic controller were 17 percent higher than the average emissions per pneumatic controller in EPA's national greenhouse gas inventory.

Environmental Science & Technology published the results of a series of coordinated studies conducted at a diverse selection of facilities in the Barnett Shale region in Texas.⁶ Researchers obtained data using a suite of measurement approaches that included “top-down” atmospheric measurements and “bottom-up” facility-level measurements. Overall, both the top-down and bottom-up studies found emissions higher than those estimated by the EPA's Greenhouse Gas (GHG) Inventory, and in some cases, higher than those reported by operators to EPA under the Mandatory Greenhouse Gas Reporting Program.⁷ The bottom up estimate was 1.5 times higher than the EPA GHG inventory.⁸ This is consistent with the findings of a 2014 synthesis paper that reviewed over 20 years of technical literature on natural gas emissions in the U.S. and Canada and similarly found measured atmospheric emissions 1.5 times higher than those estimated in the national GHG inventory.⁹

⁶ Harriss et al., “Using Multi-Scale Measurements to Improve Methane emissions Estimates from Oil and Gas Operations in the Barnett Shale, Texas: Campaign Summary,” available at <http://pubs.acs.org/doi/abs/10.1021/acs.est.5b02305>.

⁷ *Id.*

⁸ *Id.*

⁹ Brandt, et al., “Methane Leaks from North American Natural Gas Systems,” available at <http://www.sciencemag.org/content/343/6172/733>. Summary.

These papers underscore the need for air protection policies that ensure operators routinely check for, and expeditiously repair, leaks and control venting.¹⁰ Accordingly, we urge BLM to require operators in the CD-C Project Area to inspect well sites for malfunctioning or improperly maintained equipment on at least a quarterly basis. And to control venting to the maximum extent possible from activities and equipment such as well completions, tanks, and dehydrators that can lead to significant pollution that, even in the short term, is harmful to public health.

2) Fugitive emissions are unpredictable; frequent LDAR inspections are the most appropriate solution.

Fugitive emissions are a significant contributor to oil and gas emissions and a recent scientific study, the largest of its kind in the U.S., suggests fugitive emissions are also random and unpredictable, making more frequent LDAR inspections key to addressing the problem. This study, published in *Environmental Science & Technology*, found a very low degree of predictability between certain well pad and operator parameters and detected fugitive emissions. The study looked for correlation between emissions detection and well count, gas production, oil production, water production, and percent energy from oil and found only weak relationships between some factors. The study concluded that, “this low degree of predictability indicates that these large emission sources are primarily stochastic and the frequent and widespread inspection of sites to identify and repair high emission sources is critical to reducing emissions.”¹¹

3) LDAR programs are cost-effective.

Not only are frequent instrument-based inspections necessary to detect and remediate equipment leaks and unintentional tank venting, they are also highly cost effective. As illustrated by the attached analysis (Exhibit 2 included at the end of these comments), performing quarterly instrument-based inspections, whether done in-house or through a third-party contractor, is highly cost effective. Under either scenario, the natural gas savings exceed the cost of the entire program. Even if gas savings are not monetized, quarterly, LDAR programs are among the most cost effective clean air measures available to dramatically reduce pollution from oil and gas facilities.

The attached spreadsheet, which the Wyoming Outdoor Council in conjunction with the Environmental Defense Fund (EDF) has previously submitted to the state of Wyoming is now likely a conservative estimate because EPA has since updated its emissions assumptions. Nevertheless, it provides useful information regarding cost-effectiveness. The spreadsheet is based on cost and emissions information in an ICF International report and an updated LDAR memorandum,¹² and on the final cost benefit analysis prepared by the Colorado Air Pollution

¹⁰ Lyon, et al., “Constructing a Spatially Resolved Methane Emission Inventory for the Barnett Shale Region.” Available at <http://pubs.acs.org/doi/abs/10.1021/es506359c>.

¹¹ Lyon, et al., “Aerial Surveys of Elevated Hydrocarbon Emissions from Oil and Gas Production Sites.” P. 4885. Available at <http://pubs.acs.org/doi/abs/10.1021/acs.est.6b00705>.

¹² ICF International, “Economic Analysis of Methane Emission Reduction Opportunities in the U.S. Onshore Oil and Natural Gas Industries,” March 2014. LDAR analysis updated May 29, 2015. Memorandum from Joel Bluestein to Peter Zalzal.

Control Division (APCD) in support of the APCD's LDAR program in 2014.¹³ Specifically, the attached analysis – compiled by EDF – utilizes ICF's estimate of the costs to conduct quarterly LDAR in-house for a model 5-well site as the starting point. EDF increased the inspection time assumed by ICF by three hours per inspection to conservatively account for additional travel time that may be needed to travel to rural wells in Wyoming. This is based on Colorado's estimate that it would take operators an additional three hours to travel to wells outside of its Denver Metropolitan ozone nonattainment area.¹⁴

EDF also estimated the costs of conducting inspections using a third-party contractor. Colorado assumed a 30 percent profit margin for contractors that they added to the hourly rate for in-house inspectors.¹⁵ Colorado estimated that a third-party contractor could perform an inspection for \$ 134 per hour compared to the \$ 102 it would take an in-house employee. EDF used this assumption in the attached analysis and increased the hourly in-house inspection rate by 30 percent to portray the costs of hiring a contractor to perform LDAR inspections.

Per the attached spreadsheet, quarterly instrument-based inspections are highly cost-effective if operators perform them in-house or hire third-party contractors. Specifically, such inspections result in the following costs and benefits:

- \$ 4,265 per year (in-house), resulting in 10 tons of volatile organic compound (VOC) and 35 tons of methane reduced. Overall cost effectiveness is \$ 40 per ton of VOC reduced (not accounting for gas savings) and **negative** \$ 281 per ton of VOC reduced (accounting for gas savings).
- \$ 5,544 per year (contractors) with an overall cost-effectiveness of \$ 395 per ton of VOC reduced (not accounting for gas savings) and **negative** \$ 327 per ton of VOC reduced (accounting for gas savings).

Many operators can monetize the savings resulting from fixing leaks. In those cases where gas pipelines are available, operators can route the avoided gas losses to sales. In those instances where pipelines are not available currently, operators can often utilize the gas for onsite fuel. And, in many instances, gas infrastructure is in the process of being built and therefore, even if operators cannot route the saved product to sales, they will be able to do so in the near future.

ICF and the State of Colorado estimate that quarterly instrument-based inspections can achieve 60 percent reductions in leaks.¹⁶ Notably, this estimate is based on the assumption that IR cameras and other modern leak detection equipment can effectively detect leaks. It is not based on an estimate of the effectiveness of less effective sensory-based inspection methods such as audio, visual, olfactory inspection.

¹³ Colorado Air Pollution Control Division, Cost-Benefit Analysis for Proposed Revisions to AQCC Regulations No. 3 and 7 (February 7, 2014).

¹⁴ *Id.*, at p. 20-21

¹⁵ See Colorado Cost Benefit Analysis for Proposed Revisions to AQCC Regulations, p. 20

¹⁶ *Id.* At 27 (citing EPA reported data); ICF March 2014 report at 3-10.

- 4) The BLM itself has proposed a venting and flaring rule that aims to implement LDAR programs on public and tribal leases.

In addition to the fact that fugitives represent a large portion of harmful emissions at oil and gas sites and frequent LDAR inspections would be an effective strategy for reducing fugitive emissions, BLM's own proposed rule on venting, flaring and leaking of our nation's natural gas supplies aims to require LDAR programs on all public and tribal lands. 81 Fed. Reg. 6,616 (Feb. 8, 2016). Our organizations support the goals of the BLM's proposed rule and believe that the BLM should proactively include quarterly LDAR requirements in the ROD for the CD-C Project.

IV. PROPOSED DEVELOPMENT LEVELS SHOULD BE RECONSIDERED FOR THE CD-C PROJECT AREA

The development levels that would be sanctioned in the CD-C Project Area under the preferred alternative are radically out of alignment with BLM's approach and commitments to conservation of greater sage-grouse (and other resources), are based on an overly restrictive view of the agency's ability to manage development on existing leases and are not reasonably related to likely levels of development.

As discussed in detail above, the 9-Plan ARMPA imposes science-based limits on density of disturbance that are designed to protect sage-grouse and BLM has authority to ensure compliance as part of approving this project. Further, the agency has committed to mitigating impacts to other species, but the FEIS provides that "[r]oad and pipeline networks and well pads would be sited to avoid, **to the extent practicable**, sensitive wildlife habitat such as big game winter range and/or migration corridors to reduce fragmentation and minimize disturbance." FEIS at 2-18 (emphasis added). This lack of specific standards and implication of lax enforcement does not comport with BLM's obligation to first avoid and then minimize impacts. Finally, the projected levels of development are not justified by past and current activities or reasonable projections.

There is no sound reason to permit such high levels of development at this time; the project can proceed with a more reasonable level of development while still meeting the needs of the operators.¹⁷

The BLM has specified that Alternative F presented in the FEIS is its preferred alternative for implementation in the CD-C Project Area. Under this alternative, there would be certain specified protections for the Muddy Creek, Bitter Creek, Red Wash, and Chain Lake watersheds and a CD-C discussion group would be formed to address evolving energy issues.

However, the most significant provision under this alternative would be that operators would be limited "to no more than eight well pads per square mile on BLM administered lands to minimize surface disturbance and encourage directional drilling." FEIS at 2-18. Exceptions

¹⁷ Should increased levels of development actually become likely based on improved technology or other changed conditions, BLM would be able to evaluate how such development could proceed without causing unacceptable impacts, again based on available technology and data, subject to further NEPA analysis.

allowing a greater well pad density could be permitted to accommodate existing lease rights or provisions in the Rawlins RMP. *Id.* Efforts would be made to site oil and gas infrastructure so as to reduce impacts to sensitive wildlife habitats “to the extent practicable.” *Id.*

The allowance for up to 8 well pads per square mile on BLM-administered lands, let alone further “exceptions” permitting even more, does not provide sufficient protection for resources in the CD-C Project Area. Nor does it meet the development priorities outlined in the ARMPA: “Priority will be given to leasing and development of fluid mineral resources, including geothermal, outside of PHMAs and GHMAs. When analyzing leasing and authorizing development of fluid mineral resources, including geothermal, in PHMAs and GHMAs, and subject to applicable stipulations for the conservation of GRSG, priority will be given to development in non-habitat areas first and then in the least suitable habitat for GRSG.” Management Objective 14, ARMPA at 24. The ARMPA also provides that disturbance will be limited to one facility per square mile and to a cumulative five percent of suitable habitat. FEIS at 2-24, 2-25. The CD-C FEIS’s preferred alternative does not appear to reflect an attempt to prioritize or focus development outside of sage-grouse habitat first, as required by the ARMPA. *Id.*

There are 1,672 square mile sections in the CD-C Project Area and there are 980 federally owned sections. FEIS at 1-1 (Table 1-1). Under an allowance for up to eight well pads per square mile this means there could be up to 7,840 well pads permitted on the 980 federally owned sections, which is nearly the 8,950 total wells being planned in the entire project area pursuant to this FEIS.

Under Alternative F it is assumed that the number of multi-well pads will increase by 40 percent and 59 percent of the wells will be drilled directionally. FEIS at 4-8. However, it must be noted these are *assumptions*; there is no provision in the preferred alternative that *mandates* the use of directional drilling so as to reduce environmental impacts.¹⁸ And as noted, development may not even be limited to 8 well sites per section due to the provision for exceptions to this limit.

The BLM claims that “with the use of directional drilling technology, perhaps only one or two surface locations (well pads) per section would be needed, and the resultant surface disturbance could be 20 acres or less.” FEIS at 4-10. But no data or analysis is presented that supports this claim. And in fact the FEIS tends to counter this claim with statements like this: “The Proposed Action does not define the specific locations of any natural gas wells or associated facilities proposed for the CD-C project area. The analysis of impacts described in this chapter assumes that facility construction and well-drilling could occur anywhere within the project area.” *Id.* This brings into question the BLM’s claim that there will be 5,465 well pads developed under Alternative F, FEIS at 4-9 (Table 4.0-2), when its preferred alternative specifically allows for up to 8 well pads on each of the 980 sections owned by the federal

¹⁸ As stated in the FEIS, “Under Alternative F it is *assumed* that 52 percent of the new wells would be drilled from multi-well pads . . .” FEIS at 4-227 (emphasis added). Moreover, “[t]he directional drilling percentage is not a commitment on the part of the Operators and is not stated in their Project Description but is inferred from the disturbance totals and the per acre disturbance estimates described above.” *Id.* at 4-6.

government, and places no limits on how many of these well pads can be developed. It is clear there will only be limited controls on the level of surface disturbance under the preferred alternative, especially since protections for wildlife will only be put in place “to the extent practicable.”

In essence the BLM is planning to put in place an 80-acre well spacing plan for the CD-C Project Area, at least relative to surface density on federal lands. It would allow for up to 8 well pads per 640 acre federally-owned section, which represents 80 acre spacing. As can be seen on Map 4.0-2 in the FEIS, approximately 50 percent of the project area is already subject to an 80-acre spacing order from the Wyoming Oil and Gas Conservation Commission. FEIS at 4-12. But a significant portion of the project area, at least 30 percent, is subject to a less dense downhole well spacing order, 160 acres. *Id.* Many sections of BLM land are included in the 160-acre spacing provision, but now BLM is essentially converting those areas to 80 acre spacing. *See* FEIS at ES-2 (Map ES-1) (showing locations of BLM owned lands in the CD-C Project Area, many of which are in the 160 acre spacing areas shown in Map 4.0-2). Much of this 160-acre spacing area has very little existing development. FEIS at 1-2 (Map 1-1). This 160-acre spacing area also has very little existing disturbance; much of it with zero acres per section of disturbance or only 0-10 acres of disturbance. *Id.* at 2-5 (Map 2-1). Again, it is clear that the BLM’s preferred alternative will greatly increase environmental disturbance in the CD-C Project Area.

One of the most significant concerns regarding the BLM’s preferred alternative is the level of well drilling that is planned to be permitted and even encouraged. This level of drilling has little basis in the likely conditions that will prevail in the CD-C Project Area.

BLM is planning to allow, and assumes, that there could be 600 wells drilled per year in the CD-C Project Area. FEIS at 2-1. This would allow the 8,950 wells that are planned to be drilled in the 10-15 year window after project approval that BLM projects. *Id.* Yet in the past, only about two to three hundred wells have been drilled in the CD-C Project Area per year. Over the 10-year period ending December 31, 2013, drilling averaged 236 wells per year, with a peak in 2008 of 304 wells, and only 118 wells were drilled in 2013 under current economic conditions.¹⁹ *Id.* at 3-221.

Many variables will determine how many wells are actually drilled, including production success, engineering technology, economics, and lease stipulations. FEIS at 1-4, 2-18. “The actual pace and timing of development in the project area would be dependent on a variety of factors including natural gas demand, pricing, regulatory approvals, rig and manpower availability, weather, and corporate strategies.” *Id.* at 4-186. And, “[t]he total number of wells drilled would depend largely on variables outside of the Operators’ control...” *Id.* at 1-4.

The current price of natural gas is only about \$ 2.00 per MMBtu and the Energy Information Administration predicts only modest increases by 2020 with perhaps a greater increase by 2040, although under some scenarios there is little increase in price even by 2040. http://www.eia.gov/forecasts/aeo/executive_summary.cfm. There seems to be little chance that

¹⁹ We would note that this drilling took place during the development and pendency of this EIS. Scoping for the initial phase of this project began in 2005 and scoping for the revised CD-C project began in 2006. FEIS at 1-13. So this level of drilling is the best estimate of what to expect relative to well drilling in the CD-C Project Area.

well drilling levels in the CD-C Project Area will exceed the historical two to three hundred wells per year drilling level, at least in the next 10 years or so, when the well drilling is planned.

A comparison to well drilling in the Pinedale Anticline oil and gas field in Sublette County also shows that BLM's drilling projections for the CD-C are significantly over-optimistic. According to QEP Resources, which operates on the Pinedale Anticline, "[t]he Pinedale Anticline traps one of the largest accumulations of natural gas in the continental United States" and "[t]he thick and unique gas-charged section means Pinedale contains more gas per square mile than almost any other gas field in the United States." <http://www.qepres.com/operations/pinedale-anticline/>. According to the Wyoming State Geological Survey, "Pinedale field is the largest gas field in Wyoming and the sixth largest in the United States." <http://www.wsgs.wyo.gov/public-info/guide-pinedale>.

In September, 2008 the BLM completed its EIS for the Pinedale Anticline development project and approved drilling 4,399 additional wells. Well drilling was estimated to last through 2025, or 17 years. That would equate to 259 wells per year. And in fact, since the ROD for the Pinedale Anticline Project was approved on September 12, 2008, only 1,656 wells were drilled in the area between September 12, 2008 and September 12, 2015, seven years. <http://www.wy.blm.gov/jio-papo/papo/index.htm>. This equates to 237 wells per year.

Whatever else the CD-C field may be, it is not the Pinedale Anticline. While there are certainly natural gas reserves in the CD-C, they are not comparable to what is in the Pinedale Anticline, which is one of the biggest and most productive gas fields onshore in the continental United States. Yet drilling for that project only contemplated 259 wells per year being drilled and in fact only 237 wells have been drilled per year. Given these data it is impossible to see how the BLM can plan for, and to some extent promote, 600 wells per year being drilled in the CD-C Project Area. This is especially true given the two to three hundred wells per year historical level of drilling in the CD-C Project Area, which is in alignment with what has been seen in the Pinedale Anticline.

The significance of this is that the BLM should revise its development plans for the CD-C so as to recognize realistic development levels. It is *highly* unlikely there will be any need to accommodate 8,950 wells in this area on 80 acre surface spacing in the next 10-15 years. The data indicate that it is likely that no more that 2,000 to 4,500 wells will need to be accommodated in that time frame (these figures are arrived at by multiplying the 200-300 wells per year historical well-drilling development level that has been seen in the CD-C times the 10 to 15 year drilling development window that the BLM projects).

Allowing for development at this level would not in any way impair any valid existing rights that the operators have. They would have an opportunity to engage in significant levels of development for the foreseeable future. And if over time it became apparent even more development should be allowed or was needed there would be ample opportunity to accommodate any such additional development through preparation of a supplemental NEPA environmental analysis. This is what "adaptive management" contemplates—modifying plans based on actual facts that are observed and determined during initial implementation of a project.

And if only 2,000 to 4,500 wells will actually be drilled, there is also no need to allow for up to 7,840 well pads on 80 acre surface spacing on the federally owned sections of land, as Alternative F would currently permit. If 52 percent of the well pads will be multi-well, as is assumed under Alternative F (see footnote 18), no more than about 1,000 to 2,300 well pads need to be planned for. This would be a well pad density of only about 1 to 2.3 pads per federally owned section, far less than the 8 well pads per section that Alternative F would currently allow. And again, this level of drilling could be allowed while still allowing operators to fully exercise their lease rights, with allowance made for future supplemental NEPA analysis to accommodate additional development if needed.

Given the above, the BLM should modify the preferred alternative prior to issuance of the ROD. It should carefully reconsider the provisions in Alternatives B, C, and D, all of which would allow development at desired levels but with greater levels of *specified* environmental protection.²⁰ In addition, we note that Appendix C of the FEIS *requires* application of a phased development approach to concurrent reclamation as a Required Design Feature, FEIS at C-34, so even though consideration of a phased development alternative was rejected, this option needs to be reconsidered.²¹ These additional levels of protection should be incorporated into the preferred alternative. These other alternatives better reflect actual well drilling levels that are likely in the CD-C Project Area and would be based on more appropriate well pad densities, while still allowing operators to exercise their lease rights.

Alternative B, C, or D is almost certainly the “environmentally preferable” alternative which will have to be identified in the CD-C ROD. *See* 40 C.F.R. § 1505.2(b) (requiring the environmentally preferable alternative to be specified in the ROD). Given that one or more of these alternatives is clearly environmentally preferable to Alternative F, it would be appropriate to select one of these, or a combined version of them, as the preferred alternative in the ROD.

Section 1502 of the Council on Environmental Quality (CEQ) NEPA regulations requires an EIS to “state how alternatives . . . will or will not achieve the *requirements* of sections 101 and 102(1)” of NEPA. 40 C.F.R. § 1502.2(d) (emphasis added). Section 101 of NEPA creates the “productive harmony” standard and specifies a number of requirements to protect the environment. 42 U.S.C. §§ 4331 and 4332. A national policy expressed in the CEQ regulations is that agencies must “use all practicable means . . . to restore and enhance the quality of the human environment and avoid or minimize any possible adverse effects of their actions” 40 C.F.R. § 1500.2(f). Alternative F does not meet these standards and should be rejected in favor of Alternative B, C, or D, or a combined version of these alternatives, so that the “environmentally preferable” alternative is put in place in the CD-C Project Area. The Department of the Interior’s strategy for improving mitigation policies and practices and the Presidential Memorandum: *Mitigating Impacts on Natural Resources from Development and Encouraging Related Private*

²⁰ While the BLM says that Alternative D, the directional drilling alternative, which would only allow one new multi-well pad per section, would reduce the number of wells from 8,950 to 7,894, FEIS at ES-6, this is only 1000 wells less than the operators proposal, and as discussed, actually drilling even this number of wells in the next 10-15 years is highly unlikely. Permitting nearly 8000 wells to be drilled would more than meet any lease rights that have been granted in the foreseeable future, and as indicated any additional development needs could be accommodated through preparation of supplemental NEPA documents.

²¹ Another Required Design Feature is to “use directional and horizontal drilling to the extent feasible as a means to reduce surface disturbance in relation to the number of wells.” FEIS at C-34.

Investment both stand for the proposition that the environmentally preferable alternative should be selected for the CD-C.

CONCLUSION

Thank you for considering these comments regarding the Continental Divide-Creston Final Environmental Impact Statement. We encourage incorporation of these ideas and concerns into the Record of Decision for this project. Should you wish to discuss these comments further, please contact the undersigned.

Sincerely,

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Enclosures

Review of noise protocols for sage-grouse in the BLM Approved Resource Management Plan Amendment for Sage-Grouse (9-Plan) and Wyoming Governor's Executive Order 2015-4 and recommendations for revisions

May 11, 2016

Skip Ambrose, Sandhill Company
Professor Gail Patricelli, University of California, Davis
Holly Copeland, The Nature Conservancy

Our understanding of noise impacts to wildlife and especially to sage-grouse have improved in recent years. Several studies have suggested that anthropogenic noise is detrimental to Greater sage-grouse (Rogers 1964; Braun 1998; Holloran 2005). Recent studies confirm this impact experimentally by introducing recordings of industrial noise to otherwise undisturbed leks, finding immediate and sustained declines in lek attendance compared to paired control leks (29% declines on leks with introduced gas drilling noise; 73% declines on leks with introduced vehicle noise); This study also found increased stress hormones and altered behaviors on these noise playback leks (Blickley 2012; Blickley et al. 2012a; Blickley et al 2012b). **These results suggest that effective management of the natural soundscape is critical to the conservation and protection of sage-grouse (Patricelli et al. 2013).**

Accordingly, the BLM's Approved Resource Management Plan Amendment for Sage-Grouse (9-Plan) and the Wyoming Governor's Executive Order (2015-4) both incorporate language intended to manage for noise levels near leks and reduce impacts to breeding grouse. We discuss each of these in detail and conclude with recommendations to ensure consistency with the best available science.

BLM Approved Resource Management Plan Amendment (RMPA)

The BLM's RMPA for Sage-Grouse (9-plan) in Appendix C on page 131 states:

“During lekking (March 1 to May 15), restrict noise to 10dB above ambient (not to exceed 20-24 dB) measured at the perimeter of an occupied lek to lekking birds from 6 pm to 9 am. (Patricelli et al. 2010, Blickley et al. 2012)”

This RMPA rule is a significant improvement over the Wyoming Governor's Executive Order, discussed below, for two reasons. First, this rule extends the period of protection from 6pm to 9am, rather than ending at 8am. This extra hour of protection is important—we have found that an average of 17% of matings occur after 8am, ranging from 4% of matings in one lek-year to 41% in another lek-year (based on detailed observations of 12 lek-years from 5 leks near Hudson, WY, between 2006 and 2014; Patricelli and Krakauer, unpublished data). Further, the mean departure time of birds from these leks is approximately 9:00 am, with activity extending some days until 11 am. Studies of lek attendance in Colorado and Montana also found that lek activity commonly continues past 8 am (Jenni and Hartzler 1978; Walsh et al. 2004).

Second, and more important, this RMPA rule improves upon the Wyoming Governor's Executive Order because it uses a fixed ambient value as a baseline. For the reasons discussed in detail below, this is critically important for effective protection of sage-grouse breeding activity.

However, while the use of a fixed ambient value is a critical improvement over the use of measured baseline values, **using 20-24 dB is inappropriate as a measure of ambient noise.** Neither of the two papers cited in the rule, Patricelli et al. 2010 or Blickley et al. 2012, provide any justification for these ambient values. Neither of these papers report ambient values for representative areas during the lekking period. A more recent, peer-reviewed article suggests 16-20 dBA as appropriate ambient levels for sage-grouse habitat (Patricelli et al. 2013). Even these recommended values, however, were proposed as interim values, to be used until high-quality long-term measurements could be collected across sage-grouse habitat in multiple representative locations. Such an effort has now been completed and the results, described below, represent the best available science for setting baseline noise levels.

The State of Wyoming, through the Sage-grouse Local Working Groups (LWGs), funded a recent effort to measure ambient noise levels in sage habitats in four of the eight LWG Areas in Wyoming in April 2014 (13-22 days, total of 1805 hours). The four working LWG areas were: Bighorn Basin, Wind River/Sweetwater River Basin, Bates Hole/Shirley Basin, and Upper Green River Basin. Lekking hours (6 pm to 8 am) averaged 14.2 dBA (L_{90}) and 15.4 dBA (L_{50}) (Ambrose et al. 2014a). Common sounds included in these L_{50} measurements were birds, insects, and wind through vegetation, as well as farming, ranching, vehicles, and aircraft (but absent oil and gas development or other continuous noise sources). Therefore, this value represents ambient noise levels in typical sage-grouse habitat in Wyoming with some audible anthropogenic sounds, but does not include sounds of developed industrial areas. American National Standards Institute (ANSI) recommends using the L_{90} as the “residual noise level” or “background ambient” and L_{50} as “existing ambient.” In rural areas of Wyoming, prior to development, L_{90} and L_{50} values are very similar (<1.0 dBA difference), thus the choice is inconsequential.

It is important to note sound levels reported in Ambrose et al. (2014a) were often near the lower limit (noise floor) of the sound level meters used (13.5 dBA). This means that actual environmental sound levels were lower than reported by the meters. At one location, a very sensitive, 1” low-noise microphone (noise floor = 0 dBA) was deployed simultaneously with a standard ½” microphone. For this 7-day measurement period, the ½” microphone system reported L_{90} and L_{50} levels of 14.5 dBA and 16.7 dBA, respectively. For the same time period, the 1” microphone system reported L_{90} and L_{50} levels of 7.2 dBA and 14.0 dBA, respectively. In all likelihood, sound levels in rural, undeveloped Wyoming are lower than reported by Ambrose et al. (2014a) during lekking hours.

Based on the Ambrose 2013 and 2014a studies, the ambient noise levels in typical sage-grouse habitat in Wyoming (and likely rangewide) are 14-17 dBA or less. **For the purposes of establishing noise stipulations relative to greater sage-grouse, we recommend using a fixed ambient of 16 dBA as a baseline; this is consistent with a peer-reviewed publication (Patricelli et al. 2013) and widely-used reports (e.g. EPA 1971).** Allowing 10 dB of noise from new projects, this leads to an allowable level of 26 dBA.

Recent research in the Pinedale Anticline Project Area (PAPA) south of Pinedale, WY, provides further support for this recommendation. Twenty two leks were studied (19 on the PAPA and 3 outside the PAPA) by counting male grouse at the leks (2000-2014) (Wyoming Department Game and Fish, unpublished data) and measuring sound levels at the leks (2013-2014) (Ambrose et al. 2014b). L_{50} dBA sound levels at the leks were strongly associated with Poisson-transformed trends in grouse counts ($R^2 = 0.552$, $P < 0.001$); the higher the L_{50} dBA, the greater the likelihood of a declining trend. For leks on the PAPA, the average percent change from 2000 (the beginning of the observation period) for leks with $L_{50} > 26$ dBA was -69%, whereas the average change on leks with

noise <26 dBA was -29%. These data suggest that at L₅₀ sound levels of >26 dBA, negative impacts to sage-grouse due to anthropogenic noise begin to accelerate (see Figure 1).

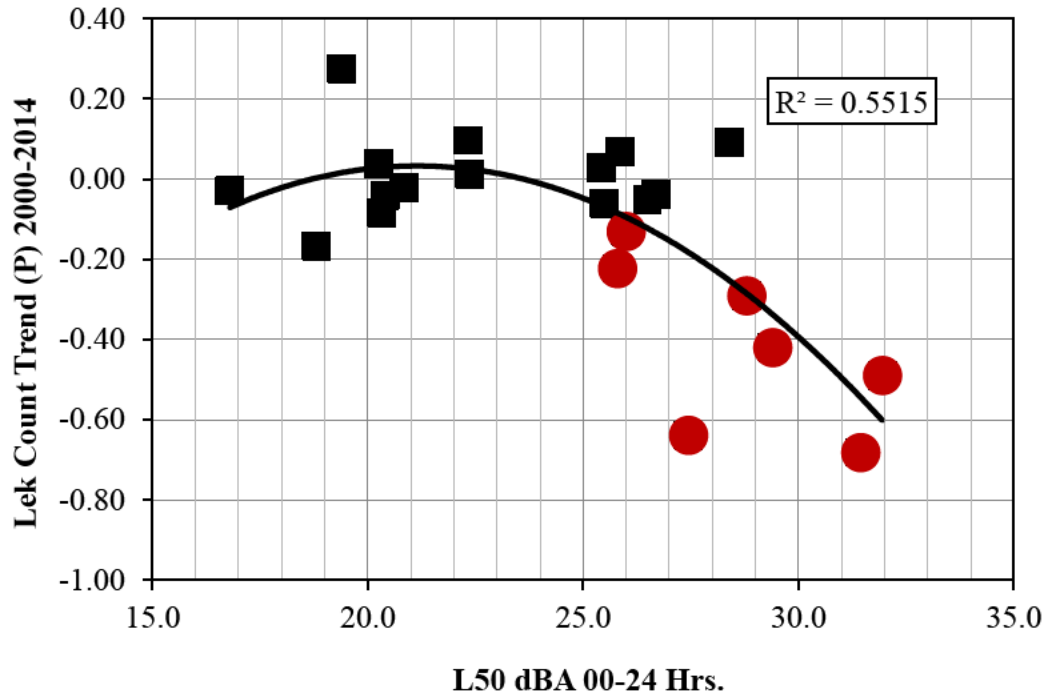


Figure 1. Trends of grouse counts (2000-2014) and L₅₀ dBA levels (2013-2014) at 22 leks (19 in the PAPA and 3 outside the PAPA). Larger, red symbols indicate that the leks have been inactive for 2 years or more. Trend lines are polynomial regression analysis.

The use of 26 dBA as a threshold is further supported by comparisons of the leks that have remained active or become inactive. We examined whether the proportion of leks that were inactive for at least the past 2 years (during noise measurement) was higher for leks exposed to L₅₀ noise levels of >26 dBA compared to leks exposed to <26 dBA. Of the leks that had L₅₀ values <26 dBA, 1 lek (10%) was inactive and 9 were active; of the leks that had L₅₀ values >26 dBA, 6 of 9 leks (66%) were inactive. Even in this small sample, this represents a significant increase in the probability of a lek becoming inactive when exposed to >26 dBA of noise (Fisher’s Exact Test, two-tailed p=0.02). Further, the median L₅₀ of inactive leks (28.8 dBA) was significantly higher than the median L₅₀ of active leks (23.9 dBA) (Mann-Whitney U=8, p<0.005).

Detailed recommendations for noise rules

For the purposes of assessing acoustic impacts to greater sage-grouse, we recommend using 26 dBA as the threshold for noise exposure (ambient 16 dBA + 10 dBA). For compliance with this limit, we recommend that measurement be made at the perimeter of the lek, with a Type I Sound Level Meter (capable of measuring the acoustic environment of the study area), for a minimum of 7 days (to cover normal variability due to different meteorological conditions) during the lekking period. The sounds of lekking birds will have minimal impacts on these measures. Pater et al. (2009) recommend noise measurement at the height most relevant to assessing noise impacts on wildlife (see also Delaney et al. 1999, Patricelli et al 2013, and others), which is also consistent with ANSI standards (1994, Section 7.3.2.4), therefore we recommend that SLM microphone height should be 12” to approximate ear height of greater sage-grouse; this microphone placement will also reduce the impact of wind, which could artificially inflate measures and count against compliance. We

recommend that the median of hourly L₅₀ values during monitoring period should be used to assess compliance (see Patricelli et al 2013 for explanation). Using this metric, one or more hours may exceed 26 dBA, but the median of all hours should be <26 dBA.

Situations When Existing Ambient Exceeds 26 dBA

There may be situations where sound levels at leks exceed an L₅₀ of 26 dBA before project initiation due to existing noise sources, though recent data suggest that this is unlikely outside of heavily-developed areas (Ambrose et al. 2014a and 2014b). In these cases, the best available evidence suggests that additional noise will increase the impact on these leks, as sage-grouse do not adapt to the presence of noise over time (as discussed below; Patricelli et al. 2013). Therefore, to limit impacts on sage grouse, new projects should not contribute to an increase in sound levels at leks already exceeding the noise limits. This rule would not preclude further development at sites that already have sources exceeding 26 dBA due to the non-additive way that multiple sound sources combine to determine overall noise levels. For example, a new source with an L₅₀ 9 dB quieter than the L₅₀ of an existing source at the measurement site would add only 0.5 dB to the total noise exposure. Therefore new projects could proceed by increasing the distance to the lek or through the use of noise-mitigation technology.

Hours Outside the Lekking Period

Maintaining lek activity involves males and females foraging, roosting, nesting and brood-rearing before and after lekking times on a daily and seasonal basis, and noise impacts may also occur during these off-lek activities (e.g. Vehrencamp et al. 1989; Wallestad and Schladweiler 1974; Schoenberg 1982; Patricelli et al. 2013). Therefore, outside of lekking hours during the breeding season, reasonable efforts should be made to keep noise as close to these limits as possible.

RECOMMENDED LANGUAGE FOR THE BLM RMPA

The most critical change to existing RMPA language is to replace to fixed ambient level of “20-24 dB” with “16 dBA”. However, additional changes to the language would provide guidance for consistent measurements to assess compliance:

Noise: Noise levels should not exceed 26 dBA at the perimeter of the lek during lekking hours (6 pm to 9 am) during the breeding season (March 1 to May 15); 26 dBA represents a level 10 dBA above existing ambient noise levels in sage-grouse habitats in rural Wyoming. Outside of lekking hours during the breeding season, reasonable efforts should be made to keep noise as close to these limits as possible. In situations where existing noise levels at leks exceed 26 dBA before project initiation, new projects should not contribute to an increase in sound levels at leks; this can be accomplished through noise mitigation measures, such as pad siting and technology that limits the combined noise exposure.

All compliance measurement should be made at the perimeter of the lek, with a Type I Sound Level Meter (capable of measuring the acoustic environment of the study area), for a minimum of 7 days (to cover normal variability due to different meteorological conditions), during lekking hours (6 pm to 9 am), during the breeding season (March 1 to May 15). Microphone height should be 12” to approximate ear height of greater sage-grouse. The median of hourly L₅₀ values during monitoring period should be used to assess compliance; using this metric, one or more hours may exceed 26 dBA, but the median of all hours will be <26 dBA. Measurement methods should follow published standards of the American National Standards Institute (ANSI).

The Wyoming Governor's Executive Order (2015-4):

“New project noise levels, either individual or cumulative, should not exceed 10 dBA (as measured by L₅₀) above baseline noise at the perimeter of the lek from 6:00 pm to 8:00 am during the breeding season (March 1 to May 15). Specific noise protocols for measurement and implementation will be developed as additional research and information emerges.”

Although this statement appears straightforward and logical, the Wyoming Governor's Executive Order has a critical deficiency because it fails define a fixed statewide “baseline noise” level and leaves the meaning of this term open for interpretation. “Baseline noise” could be interpreted to mean the baseline levels in a representative area with little to no human impact, or it could be interpreted as the noise levels at the proposed site before development occurs. The latter interpretation, establishing baseline noise on a lek-by-lek or site-by-site basis, will inevitably lead to inappropriately high measures of baseline, thereby increasing the allowable noise and providing insufficient protection for greater sage-grouse (Patricelli et al. 2013). This will occur 1) because accurate measurement of baseline noise levels at each lek or development site is difficult and expensive, 2) because nearly every error in the choice, placement, use, and maintenance of the equipment will lead to overestimation of baseline noise values, thus higher allowable noise limits, and 3) because even accurate measures would include existing activity in the baseline, leading to incremental increases in impacts to sage-grouse (Patricelli et al. 2013).

This third concern—about incremental increases in noise exposure—is especially critical. For example, assume that background noise levels at a lek in are 16 dBA during the lekking period (6pm to 9am). Assume in year 1 that a gas drilling operation is proposed 4.0 miles away, leading to an increase in the sound level at the lek to 21 dBA. This is less than 10 dBA over the baseline noise of 16 dBA, and thus would be in compliance with the EO. The new baseline noise at this lek would become 21 dBA. Then assume in year 2 a gas drilling operation is proposed 2.0 miles away, leading to an increase in the sound level at the lek to 27 dBA. This is less than 10 dBA over the baseline noise of 21 dBA, and thus would be in compliance. The new baseline noise would become 27 dBA. Then assume in year 3 a gas drilling operation is proposed 1.0 miles distant, leading to an increase in the sound level at the lek to 33 dBA. This is less than the 10 dBA over the baseline noise of 27 dBA, and thus would be in compliance. The new baseline noise would become 33 dBA. And so on. In this example, the “baseline noise” increases incrementally with each new and closer activity, even though no single project exceeded the 10 dBA over baseline threshold. This could continue until the drilling operation was 100 feet from the lek, with the same assessment of “no impact.” However, the best available evidence suggests that additional noise will increase the impact on these leks, because sage-grouse do not adapt to the presence of noise over time (Patricelli et al. 2013). In a 3-year experimental introduction of noise to leks, Blickley et al. (2012a) found an immediate decline in male lek attendance, which did not abate over time, and increased stress hormones in the second and third years of playback (Blickley et al. 2012b). The inclusion of existing noise into ambient values clearly does not protect greater sage-grouse.

Indeed, the Wyoming Governor's Executive Order has already been interpreted to mean that noise levels should be measured at lek edge before project initiation. The Noise Impact Analysis Report prepared by Behrens and Associates, Inc. for proposed infill drilling on the Jonah Field (Behrens and Associates, 2016), states the following: “In the absence of any newly developed protocols, based on the language in the EO the ambient/baseline noise level is taken to be measured L₅₀ sound levels between the hours of 6:00 p.m. and 8:00 a.m. as measured without any nearby drilling activity.” The

report states that there was no nearby drilling activity; however, “nearby” is not defined and the leks are described as having “existing oil and gas related facilities nearby”. While there may not have been drilling activity audible to the engineers, there is a great deal of gas field activity near the focal leks, contributing to ambient noise levels. The resulting measures of ambient noise reported (30.0 dBA L₅₀ at one lek and 36.3 dBA at another) are typical of rural areas with human activity, such as farm lands (EPA 1971). These values are also higher than measurements from the same locations collected by Sandhill Company (28.3 dBA L₅₀ and 29.0 dBA respectively; See attached). This discrepancy is likely due to microphone placement and the fact that the Behrens report did not exclude periods of wind exceeding 5 m/s, as described in ANSI standards. As a result, the report concluded that allowable noise levels on two focal leks were 40 dBA and 46 dBA. These values are extremely high. If undisturbed baseline noise is 14-17 dBA (or less, see above), the second lek would be exposed to noise levels 29-32 dB higher—and therefore more than 8 times louder—than baseline levels. Based on results from experimental studies (Blickley et al. 2012a and 2012b) and observational analyses (see above), are likely to cause a significant impact to sage-grouse populations. A detailed critique of this report is provided in Attachment A.

Commitment to Using “Best Science”

The BLM states a continued commitment to research and use of best available science in the RMPA: *“Through implementation of this strategy, new management issues and questions are likely to arise that may warrant additional guidance or study by technical experts, scientists, and researchers. The BLM is committed to continue working with individuals and institutions with expertise in relevant fields in order to ensure that land and resource management affecting conservation of the GRSG and the sagebrush ecosystem continues to be guided by sound peer-reviewed research and the best available science.”*

The Wyoming Executive Order ends with the statement *“Specific noise protocols for measurement and implementation will be developed as additional research and information emerges.”*

We emphasize that the research and information needed to establish a scientifically defensible ambient standard and develop specific protocols for measuring 10 dBA above this standard are already available. The critical problem with the Wyoming EO rule could be addressed by providing a specific protocol for implementation which specifies a fixed background noise level. We recommend setting this baseline as 16 dBA for both the RMPA and the Wyoming EO, as discussed above, thus setting maximum allowable noise levels at 26 dBA. The BLM’s RMPA ambient standard of 20-24 dBA is a critical improvement from no ambient standard in the Wyoming EO; however values above 16 dBA are too high based on the research cited above, and we recommend adjusting to 16 dBA as the fixed baseline.

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Review of noise protocols for sage-grouse in the BLM Approved Resource Management Plan Amendment for Sage-Grouse (9-Plan) and Wyoming Governor's Executive Order 2015-4 and recommendations for revisions

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Accordingly, the BLM's Approved Resource Management Plan Amendment for Sage-Grouse (9-Plan) and the Wyoming Governor's Executive Order (2015-4) both incorporate language intended to manage for noise levels near leks and reduce impacts to breeding grouse. We discuss each of these in detail and conclude with recommendations to ensure consistency with the best available science.

BLM Approved Resource Management Plan Amendment (RMPA)

The BLM's RMPA for Sage-Grouse (9-plan) in Appendix C on page 131 states:

“During lekking (March 1 to May 15), restrict noise to 10dB above ambient (not to exceed 20-24 dB) measured at the perimeter of an occupied lek to lekking birds from 6 pm to 9 am. (Patricelli et al. 2010, Blickley et al. 2012)”

This RMPA rule is a significant improvement over the Wyoming Governor's Executive Order, discussed below, for two reasons. First, this rule extends the period of protection from 6pm to 9am, rather than ending at 8am. This extra hour of protection is important—we have found that an average of 17% of matings occur after 8am, ranging from 4% of matings in one lek-year to 41% in another lek-year (based on detailed observations of 12 lek-years from 5 leks near Hudson, WY, between 2006 and 2014; Patricelli and Krakauer, unpublished data). Further, the mean departure time of birds from these leks is approximately 9:00 am, with activity extending some days until 11 am. Studies of lek attendance in Colorado and Montana also found that lek activity commonly continues past 8 am (Jenni and Hartzler 1978; Walsh et al. 2004).

Second, and more important, this RMPA rule improves upon the Wyoming Governor's Executive Order because it uses a fixed ambient value as a baseline. For the reasons discussed in detail below, this is critically important for effective protection of sage-grouse breeding activity.

However, while the use of a fixed ambient value is a critical improvement over the use of measured baseline values, **using 20-24 dB is inappropriate as a measure of ambient noise.** Neither of the two papers cited in the rule, Patricelli et al. 2010 or Blickley et al. 2012, provide any justification for these ambient values. Neither of these papers report ambient values for representative areas during the lekking period. A more recent, peer-reviewed article suggests 16-20 dBA as appropriate ambient levels for sage-grouse habitat (Patricelli et al. 2013). Even these recommended values, however, were proposed as interim values, to be used until high-quality long-term measurements could be collected across sage-grouse habitat in multiple representative locations. Such an effort has now been completed and the results, described below, represent the best available science for setting baseline noise levels.

The State of Wyoming, through the Sage-grouse Local Working Groups (LWGs), funded a recent effort to measure ambient noise levels in sage habitats in four of the eight LWG Areas in Wyoming in April 2014 (13-22 days, total of 1805 hours). The four working LWG areas were: Bighorn Basin, Wind River/Sweetwater River Basin, Bates Hole/Shirley Basin, and Upper Green River Basin. Lekking hours (6 pm to 8 am) averaged 14.2 dBA (L_{90}) and 15.4 dBA (L_{50}) (Ambrose et al. 2014a). Common sounds included in these L_{50} measurements were birds, insects, and wind through vegetation, as well as farming, ranching, vehicles, and aircraft (but absent oil and gas development or other continuous noise sources). Therefore, this value represents ambient noise levels in typical sage-grouse habitat in Wyoming with some audible anthropogenic sounds, but does not include sounds of developed industrial areas. American National Standards Institute (ANSI) recommends using the L_{90} as the “residual noise level” or “background ambient” and L_{50} as “existing ambient.” In rural areas of Wyoming, prior to development, L_{90} and L_{50} values are very similar (<1.0 dBA difference), thus the choice is inconsequential.

It is important to note sound levels reported in Ambrose et al. (2014a) were often near the lower limit (noise floor) of the sound level meters used (13.5 dBA). This means that actual environmental sound levels were lower than reported by the meters. At one location, a very sensitive, 1” low-noise microphone (noise floor = 0 dBA) was deployed simultaneously with a standard ½” microphone. For this 7-day measurement period, the ½” microphone system reported L_{90} and L_{50} levels of 14.5 dBA and 16.7 dBA, respectively. For the same time period, the 1” microphone system reported L_{90} and L_{50} levels of 7.2 dBA and 14.0 dBA, respectively. In all likelihood, sound levels in rural, undeveloped Wyoming are lower than reported by Ambrose et al. (2014a) during lekking hours.

Based on the Ambrose 2013 and 2014a studies, the ambient noise levels in typical sage-grouse habitat in Wyoming (and likely rangewide) are 14-17 dBA or less. **For the purposes of establishing noise stipulations relative to greater sage-grouse, we recommend using a fixed ambient of 16 dBA as a baseline; this is consistent with a peer-reviewed publication (Patricelli et al. 2013) and widely-used reports (e.g. EPA 1971).** Allowing 10 dB of noise from new projects, this leads to an allowable level of 26 dBA.

Recent research in the Pinedale Anticline Project Area (PAPA) south of Pinedale, WY, provides further support for this recommendation. Twenty two leks were studied (19 on the PAPA and 3 outside the PAPA) by counting male grouse at the leks (2000-2014) (Wyoming Department Game and Fish, unpublished data) and measuring sound levels at the leks (2013-2014) (Ambrose et al. 2014b). L_{50} dBA sound levels at the leks were strongly associated with Poisson-transformed trends in grouse counts ($R^2 = 0.552$, $P < 0.001$); the higher the L_{50} dBA, the greater the likelihood of a declining trend. For leks on the PAPA, the average percent change from 2000 (the beginning of the observation period) for leks with $L_{50} > 26$ dBA was -69%, whereas the average change on leks with

noise <26 dBA was -29%. These data suggest that at L₅₀ sound levels of >26 dBA, negative impacts to sage-grouse due to anthropogenic noise begin to accelerate (see Figure 1).

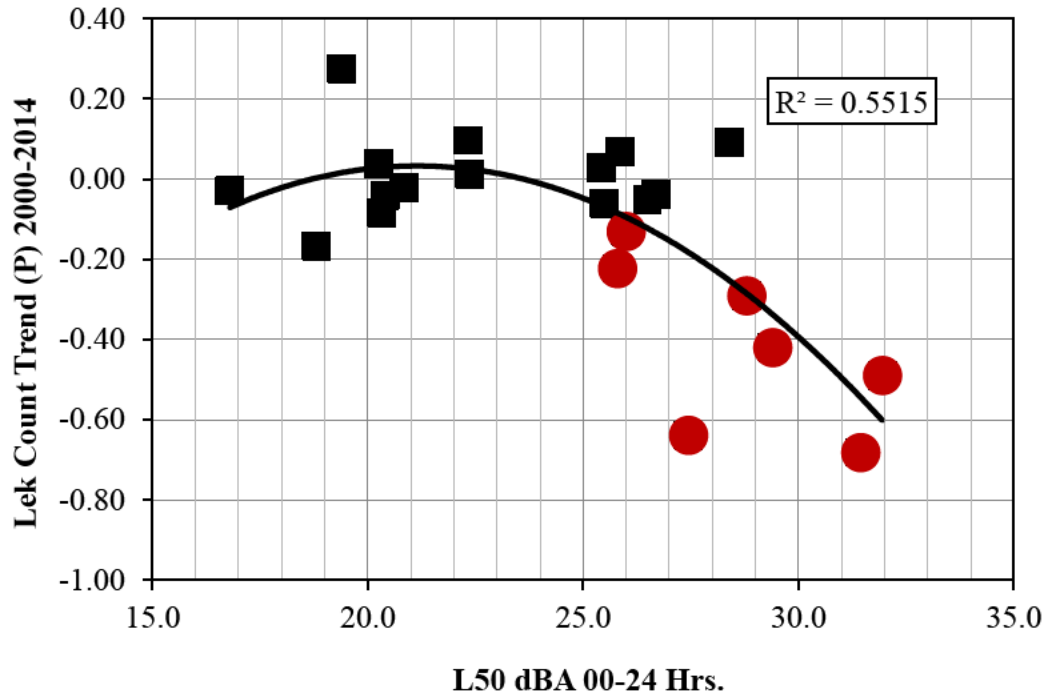


Figure 1. Trends of grouse counts (2000-2014) and L₅₀ dBA levels (2013-2014) at 22 leks (19 in the PAPA and 3 outside the PAPA). Larger, red symbols indicate that the leks have been inactive for 2 years or more. Trend lines are polynomial regression analysis.

The use of 26 dBA as a threshold is further supported by comparisons of the leks that have remained active or become inactive. We examined whether the proportion of leks that were inactive for at least the past 2 years (during noise measurement) was higher for leks exposed to L₅₀ noise levels of >26 dBA compared to leks exposed to <26 dBA. Of the leks that had L₅₀ values <26 dBA, 1 lek (10%) was inactive and 9 were active; of the leks that had L₅₀ values >26 dBA, 6 of 9 leks (66%) were inactive. Even in this small sample, this represents a significant increase in the probability of a lek becoming inactive when exposed to >26 dBA of noise (Fisher’s Exact Test, two-tailed p=0.02). Further, the median L₅₀ of inactive leks (28.8 dBA) was significantly higher than the median L₅₀ of active leks (23.9 dBA) (Mann-Whitney U=8, p<0.005).

Detailed recommendations for noise rules

For the purposes of assessing acoustic impacts to greater sage-grouse, we recommend using 26 dBA as the threshold for noise exposure (ambient 16 dBA + 10 dBA). For compliance with this limit, we recommend that measurement be made at the perimeter of the lek, with a Type I Sound Level Meter (capable of measuring the acoustic environment of the study area), for a minimum of 7 days (to cover normal variability due to different meteorological conditions) during the lekking period. The sounds of lekking birds will have minimal impacts on these measures. Pater et al. (2009) recommend noise measurement at the height most relevant to assessing noise impacts on wildlife (see also Delaney et al. 1999, Patricelli et al 2013, and others), which is also consistent with ANSI standards (1994, Section 7.3.2.4), therefore we recommend that SLM microphone height should be 12” to approximate ear height of greater sage-grouse; this microphone placement will also reduce the impact of wind, which could artificially inflate measures and count against compliance. We

recommend that the median of hourly L₅₀ values during monitoring period should be used to assess compliance (see Patricelli et al 2013 for explanation). Using this metric, one or more hours may exceed 26 dBA, but the median of all hours should be <26 dBA.

Situations When Existing Ambient Exceeds 26 dBA

There may be situations where sound levels at leks exceed an L₅₀ of 26 dBA before project initiation due to existing noise sources, though recent data suggest that this is unlikely outside of heavily-developed areas (Ambrose et al. 2014a and 2014b). In these cases, the best available evidence suggests that additional noise will increase the impact on these leks, as sage-grouse do not adapt to the presence of noise over time (as discussed below; Patricelli et al. 2013). Therefore, to limit impacts on sage grouse, new projects should not contribute to an increase in sound levels at leks already exceeding the noise limits. This rule would not preclude further development at sites that already have sources exceeding 26 dBA due to the non-additive way that multiple sound sources combine to determine overall noise levels. For example, a new source with an L₅₀ 9 dB quieter than the L₅₀ of an existing source at the measurement site would add only 0.5 dB to the total noise exposure. Therefore new projects could proceed by increasing the distance to the lek or through the use of noise-mitigation technology.

Hours Outside the Lekking Period

Maintaining lek activity involves males and females foraging, roosting, nesting and brood-rearing before and after lekking times on a daily and seasonal basis, and noise impacts may also occur during these off-lek activities (e.g. Vehrencamp et al. 1989; Wallestad and Schladweiler 1974; Schoenberg 1982; Patricelli et al. 2013). Therefore, outside of lekking hours during the breeding season, reasonable efforts should be made to keep noise as close to these limits as possible.

RECOMMENDED LANGUAGE FOR THE BLM RMPA

The most critical change to existing RMPA language is to replace to fixed ambient level of “20-24 dB” with “16 dBA”. However, additional changes to the language would provide guidance for consistent measurements to assess compliance:

Noise: Noise levels should not exceed 26 dBA at the perimeter of the lek during lekking hours (6 pm to 9 am) during the breeding season (March 1 to May 15); 26 dBA represents a level 10 dBA above existing ambient noise levels in sage-grouse habitats in rural Wyoming. Outside of lekking hours during the breeding season, reasonable efforts should be made to keep noise as close to these limits as possible. In situations where existing noise levels at leks exceed 26 dBA before project initiation, new projects should not contribute to an increase in sound levels at leks; this can be accomplished through noise mitigation measures, such as pad siting and technology that limits the combined noise exposure.

All compliance measurement should be made at the perimeter of the lek, with a Type I Sound Level Meter (capable of measuring the acoustic environment of the study area), for a minimum of 7 days (to cover normal variability due to different meteorological conditions), during lekking hours (6 pm to 9 am), during the breeding season (March 1 to May 15). Microphone height should be 12” to approximate ear height of greater sage-grouse. The median of hourly L₅₀ values during monitoring period should be used to assess compliance; using this metric, one or more hours may exceed 26 dBA, but the median of all hours will be <26 dBA. Measurement methods should follow published standards of the American National Standards Institute (ANSI).

The Wyoming Governor's Executive Order (2015-4):

“New project noise levels, either individual or cumulative, should not exceed 10 dBA (as measured by L₅₀) above baseline noise at the perimeter of the lek from 6:00 pm to 8:00 am during the breeding season (March 1 to May 15). Specific noise protocols for measurement and implementation will be developed as additional research and information emerges.”

Although this statement appears straightforward and logical, the Wyoming Governor's Executive Order has a critical deficiency because it fails define a fixed statewide “baseline noise” level and leaves the meaning of this term open for interpretation. “Baseline noise” could be interpreted to mean the baseline levels in a representative area with little to no human impact, or it could be interpreted as the noise levels at the proposed site before development occurs. The latter interpretation, establishing baseline noise on a lek-by-lek or site-by-site basis, will inevitably lead to inappropriately high measures of baseline, thereby increasing the allowable noise and providing insufficient protection for greater sage-grouse (Patricelli et al. 2013). This will occur 1) because accurate measurement of baseline noise levels at each lek or development site is difficult and expensive, 2) because nearly every error in the choice, placement, use, and maintenance of the equipment will lead to overestimation of baseline noise values, thus higher allowable noise limits, and 3) because even accurate measures would include existing activity in the baseline, leading to incremental increases in impacts to sage-grouse (Patricelli et al. 2013).

This third concern—about incremental increases in noise exposure—is especially critical. For example, assume that background noise levels at a lek in are 16 dBA during the lekking period (6pm to 9am). Assume in year 1 that a gas drilling operation is proposed 4.0 miles away, leading to an increase in the sound level at the lek to 21 dBA. This is less than 10 dBA over the baseline noise of 16 dBA, and thus would be in compliance with the EO. The new baseline noise at this lek would become 21 dBA. Then assume in year 2 a gas drilling operation is proposed 2.0 miles away, leading to an increase in the sound level at the lek to 27 dBA. This is less than 10 dBA over the baseline noise of 21 dBA, and thus would be in compliance. The new baseline noise would become 27 dBA. Then assume in year 3 a gas drilling operation is proposed 1.0 miles distant, leading to an increase in the sound level at the lek to 33 dBA. This is less than the 10 dBA over the baseline noise of 27 dBA, and thus would be in compliance. The new baseline noise would become 33 dBA. And so on. In this example, the “baseline noise” increases incrementally with each new and closer activity, even though no single project exceeded the 10 dBA over baseline threshold. This could continue until the drilling operation was 100 feet from the lek, with the same assessment of “no impact.” However, the best available evidence suggests that additional noise will increase the impact on these leks, because sage-grouse do not adapt to the presence of noise over time (Patricelli et al. 2013). In a 3-year experimental introduction of noise to leks, Blickley et al. (2012a) found an immediate decline in male lek attendance, which did not abate over time, and increased stress hormones in the second and third years of playback (Blickley et al. 2012b). The inclusion of existing noise into ambient values clearly does not protect greater sage-grouse.

Indeed, the Wyoming Governor's Executive Order has already been interpreted to mean that noise levels should be measured at lek edge before project initiation. The Noise Impact Analysis Report prepared by Behrens and Associates, Inc. for proposed infill drilling on the Jonah Field (Behrens and Associates, 2016), states the following: “In the absence of any newly developed protocols, based on the language in the EO the ambient/baseline noise level is taken to be measured L₅₀ sound levels between the hours of 6:00 p.m. and 8:00 a.m. as measured without any nearby drilling activity.” The

report states that there was no nearby drilling activity; however, “nearby” is not defined and the leks are described as having “existing oil and gas related facilities nearby”. While there may not have been drilling activity audible to the engineers, there is a great deal of gas field activity near the focal leks, contributing to ambient noise levels. The resulting measures of ambient noise reported (30.0 dBA L₅₀ at one lek and 36.3 dBA at another) are typical of rural areas with human activity, such as farm lands (EPA 1971). These values are also higher than measurements from the same locations collected by Sandhill Company (28.3 dBA L₅₀ and 29.0 dBA respectively; See attached). This discrepancy is likely due to microphone placement and the fact that the Behrens report did not exclude periods of wind exceeding 5 m/s, as described in ANSI standards. As a result, the report concluded that allowable noise levels on two focal leks were 40 dBA and 46 dBA. These values are extremely high. If undisturbed baseline noise is 14-17 dBA (or less, see above), the second lek would be exposed to noise levels 29-32 dB higher—and therefore more than 8 times louder—than baseline levels. Based on results from experimental studies (Blickley et al. 2012a and 2012b) and observational analyses (see above), are likely to cause a significant impact to sage-grouse populations. A detailed critique of this report is provided in Attachment A.

Commitment to Using “Best Science”

The BLM states a continued commitment to research and use of best available science in the RMPA: *“Through implementation of this strategy, new management issues and questions are likely to arise that may warrant additional guidance or study by technical experts, scientists, and researchers. The BLM is committed to continue working with individuals and institutions with expertise in relevant fields in order to ensure that land and resource management affecting conservation of the GRSG and the sagebrush ecosystem continues to be guided by sound peer-reviewed research and the best available science.”*

The Wyoming Executive Order ends with the statement *“Specific noise protocols for measurement and implementation will be developed as additional research and information emerges.”*

We emphasize that the research and information needed to establish a scientifically defensible ambient standard and develop specific protocols for measuring 10 dBA above this standard are already available. The critical problem with the Wyoming EO rule could be addressed by providing a specific protocol for implementation which specifies a fixed background noise level. We recommend setting this baseline as 16 dBA for both the RMPA and the Wyoming EO, as discussed above, thus setting maximum allowable noise levels at 26 dBA. The BLM’s RMPA ambient standard of 20-24 dBA is a critical improvement from no ambient standard in the Wyoming EO; however values above 16 dBA are too high based on the research cited above, and we recommend adjusting to 16 dBA as the fixed baseline.

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Quarterly and Annual OGI LDAR Cost-Effectiveness Calculation ^[1]

Surveyor: Frequency:	Well Pad LDAR Conducted by Operator			Well Pad LDAR Conducted by Contractor		
	Quarterly	Semi-Annual	Annual	Quarterly	Semi-Annual	Annual
Methane Mcf Overall ^[2]	3,058	3,058	3,058	3,058	3,058	3,058
VOC emissions (mt)	16.14	16.14	16.14	16.14	16.14	16.14
Methane emissions (mt)	58.10	58.10	58.10	58.10	58.10	58.10
CH4/VOC Ratio	3.60	3.60	3.60	3.60	3.60	3.60
% Reduction	60%	50%	40%	60%	50%	40%
Methane Mcf reduced	1,835	1,529	1,223	1,835	1,529	1,223
VOC reduction (mt)	9.68	8.07	6.46	9.68	8.07	6.46
CH4 reduction (mt)	34.86	29.05	23.24	34.86	29.05	23.24
Time per Inspection (hrs)	5.7	5.7	5.7	5.7	5.7	5.7
Inspections per year	4	2	1	4	2	1
Inspection Time (hrs/yr)	22.7	11.3	5.7	22.7	11.3	5.7
Hourly Cost (\$/hr)	\$101.64	\$101.64	\$101.64	\$132.13	\$132.13	\$132.13
Initial set-up Cost, \$	\$230.51	\$230.51	\$230.51	\$299.66	\$299.66	\$299.66
Inspection Cost, \$/yr	\$2,305.10	\$1,152.55	\$576.27	\$2,996.63	\$1,498.31	\$749.16
Repair Cost, \$	\$1,728.82	\$1,440.69	\$1,152.55	\$2,247.47	\$1,872.89	\$1,498.31
Total Cost, \$	\$4,264.43	\$2,823.74	\$1,959.33	\$5,543.76	\$3,670.87	\$2,547.13
Recovered gas value ^[3] , \$	\$6,984.57	\$5,820.48	\$4,656.38	\$6,984.57	\$5,820.48	\$4,656.38
Net cost, \$	-\$2,720.15	-\$2,996.73	-\$2,697.05	-\$1,440.82	-\$2,149.61	-\$2,109.25
\$/mt VOC-No gas credit	\$440.42	\$349.95	\$303.53	\$572.54	\$454.94	\$394.59
\$/mt CH4-No gas credit	\$122.34	\$97.21	\$84.31	\$159.04	\$126.37	\$109.61
\$/mt VOC-Gas credit	-\$280.93	-\$371.39	-\$417.82	-\$148.80	-\$266.41	-\$326.76
\$/mt CH4-Gas credit	-\$78.04	-\$103.16	-\$116.06	-\$41.33	-\$74.00	-\$90.77
\$/Mcf CH4-No gas credit	\$2.32	\$1.85	\$1.60	\$3.02	\$2.40	\$2.08
\$/Mcf CH4-Gas credit	-\$1.48	-\$1.96	-\$2.21	-\$0.79	-\$1.41	-\$1.72

OGI Hourly LDAR Cost Calculation ^[4]

Labor		Capital and Initial Costs	
Inspection Staff	\$75,000	Infrared Camera	\$122,200
Supervision (@ 20%)	\$15,000	Photo Ionization Detector	\$5,000
Overhead (@10%)	\$7,500	Truck	\$22,000
Travel (@15%)	\$11,250	Recordkeeping System	\$14,500
Recordkeeping (@10%)	\$7,500	Total	\$163,700
Reporting (@10%)	\$7,500	Hours/yr	1,880
Fringe (@30%)	\$22,500	Hourly Labor Rate	\$77.79
Subtotal Costs	\$146,250	Training Hours	80
		Training Dollars	\$6,223
		Amortized Capital +Training	\$44,825
		Annual Labor	\$146,250
		Annual Total Cost	\$191,075
		Total Hourly Cost (LDAR conducted by operator)	\$101.64
		Total Hourly Cost (LDAR Conducted by contractors, 30% profit margin) ^[5]	\$132.13

Notes:

[1] Analysis compiled by EDF based on (1) ICF quarterly IR camera LDAR analysis and (2) additional assumptions. These assumptions include an additional 3 hours for inspection time to account for increased travel time (per CO Cost-Benefit analysis assumptions), and decreased repair time for semi-annual and annual inspections (equal to 2X the inspection time for annual and 2.5X for semi-annual, rather than 3X the inspection time for quarterly).

[2] For well pads, methane content of natural gas assumed to be 78.8%.

[3] Costs are based on gas value of \$3/Mcf gas. The original analysis used \$4/Mcf, but this has been updated to reflect current prices

[4] Hourly costs for IR Camera LDAR based on annualized rate of 5-year, 10%.

[5] Hourly cost for contractor includes 30% profit margin, per the CO Cost-Benefit Analysis Assumption.

From: Connie Brooks
To: laceyand@blm.gov
Cc: [Van_Elsbernd_\(van_wan@comcast.net\)](mailto:Van_Elsbernd_(van_wan@comcast.net))
Subject: Salt Wells Crossing Permit
Date: Friday, May 27, 2016 6:26:21 PM
Attachments: [IM 2015-120, Implementing Amended Section 402\(h\) \(2\) of the Federal Land Policy and Management Act.pdf](#)
[Section 3023 Permit renewal Crossing Permits PLAW-113publ291.pdf](#)
[IM 2015-121, Implementing Amended Section 402\(h\)\(1\) of Federal Land Policy and Management Act.pdf](#)

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Dear Lacy,

I am attaching the relevant sections from the Carl Levin and Howard P. “Buck” Mckeon National Defense Reauthorization Act. These two sections authorize a categorical exclusion for renewal of an existing grazing permit and for issuing crossing or trailing permits. There are also two IMs issued by BLM on July 15, 2015 to implement these changes. You may already have these but I am sending them along for your convenience.

Based on what Marc Dickinson understood, the Rock Springs office was relying on direction developed in response to a Western Watersheds Project case. I have not found the precise case but believe the congressional action in 2014 overrides any administrative or judicial decision. BLM issued IMs shortly after enactment and I believe the IM authorizes a categorical exclusion for the requested crossing permit.

IM 2015-121 authorizes categorical exclusions for permit renewals and refers to historical use. IM 2015-120 authorizes categorical exclusions for a trailing or crossing permit. There are no conditions except that a permit must not fall within the 12 extraordinary circumstances that always apply to a categorical exclusion. 43 C.F.R. 46.215. The short duration of use and relatively limited area affected should clearly avoid any of the extraordinary circumstances. Moreover the fact that the area has not been regularly grazed favors the brief crossing.

Please call me if you have any questions or we need to address something we are not aware of.

Sincerely,

Connie Brooks

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240
<http://www.blm.gov>

July 15, 2015

In Reply Refer To:
4110 (220) PEMS TRANSMISSION 07/15/2015
Instruction Memorandum No. 2015-120
Expires: 09/30/2018

To: All Field Office Officials

From: Assistant Director, Resources and Planning

Subject: Implementing Amended Section 402(h) (2) of the Federal Land Policy and Management Act - Using a Categorical Exclusion for Trailing Livestock on Public Land

Program Area: Rangeland Management (1020)

Purpose: Section 3023 in Public Law (PL) 113-291, National Defense Authorization Act (NDAA) 2015, amends Section 402 of the Federal Land Policy and Management Act of 1976 (FLPMA) by including six new provisions and one modified provision related to livestock grazing. This Instruction Memorandum (IM) provides direction for analyzing effects of livestock trailing and issuing crossing permits in accordance with this amendment to FLPMA, the new Section 402(h)(2), pending incorporation into Handbook H-4130-1, Authorizing Grazing Use.

Policy/Action: The Authorized Officer (AO) may apply a categorical exclusion (CX) to issue a crossing permit. A decision document must be prepared for the action. For general guidance on the use of a CX, please refer to the Departmental regulations at 43 CFR §§ 46.205 through 46.215, the BLM National Environmental Policy Act (NEPA) Handbook (H-1790-1), and the Departmental Manual at 516 DM 11. The application of this CX does not reduce or eliminate regulatory requirements or other program-specific policies, including the obligation to issue a decision that would provide opportunities for interested parties or the public to protest and/or appeal the decision except during the remainder of FY 2015 as explained below.

The decision to use the CX or prepare a NEPA analysis will depend on the resources affected, by the kind of livestock that will be trailed across public lands, the type and magnitude of the anticipated effects of the trailing use, as well as any resource issues present on the trailing route.

For example, application of the CX may not be appropriate if use of public land for trailing is more than incidental, sensitive resources are affected, or the effects of trailing are extensive.

Review the 12 extraordinary circumstances from Departmental Manual 516 to help determine whether use of a CX is appropriate. The degree of detail and analysis needed is left up to the judgment of the AO.

For Fiscal Year (FY) 2015 only, in accordance with Public Law 113-76 the Consolidated Appropriations Act, 2014, when a decision is issued to authorize a crossing permit, the AO should replace the traditional administrative appeal rights language, which is included in the final decision, with a statement informing the affected permittee/lessee or the interested public that the decision is not subject to protest and/or administrative appeal under 43 CFR § 4160. Suggested language for this revised notice is:

"Pursuant to Section 125 of Division G, Title I. General Provisions, PL 113-76, the Consolidated Appropriations Act, 2014, this BLM final decision is not subject to protest and/or administrative appeal under subpart E of Part 4 of Title 43, Code of Federal Regulations and subpart 4160 of part 4100 of such title."

Public Law 113-76 removes the application of the protest and administrative appeal process of 43 CFR Subpart 4160 from the issuance of crossing permits until the end of FY 2015, but does not eliminate the requirement to notify affected permittees and the interested public of the issuance of a crossing permit. The field office (FO) should consult with the BLM State Office Rangeland Management Program Leads if there are questions regarding crossing permit applications.

Beginning October 1, 2015, crossing permit decisions will be issued in accordance with 43 CFR § 4160 and include standard protest and administrative appeal language.

This amendment to FLPMA does not alter the AO's responsibilities under the Endangered Species Act of 1973 (16 U.S.C. §§ 1531 et seq.), the National Historic Preservation Act of 1966 (16 U.S.C. §§ 470 et seq.) or any other applicable statutes.

Background: Section 3023 "Grazing Permits and Leases" of Public Law (PL) 113-291, The Carl Levin and Howard P. 'Buck' McKeon National Defense Authorization Act for Fiscal Year 2015, amended Section 402 of FLPMA by modifying one provision and adding six new provisions. One of the new provisions of FLPMA is Sec. 402(h)(2) "TRAILING AND CROSSING.—The trailing and crossing of livestock across public land and National Forest System land and the implementation of trailing and crossing practices by the Secretary concerned may be categorically excluded from the requirement to prepare an environmental assessment or an environmental impact statement under the NEPA of 1969 (42 U.S.C. 4321 et seq.)." This IM provides direction for the Trailing and Crossing provision.

Timeframe: This policy is effective immediately.
Budget Impact: Use of the CX can reduce the time needed to process an application to trail livestock on public land and can expedite the process for incidental trailing use. Actual budget impact is likely to be small for any individual office, but frees-up time for processing grazing permits.

Manual/Handbook Sections Affected: Handbook H-4130-1, rel. 4-75, 7-31-84, Authorizing Grazing Use, and the National Environmental Policy Handbook H-1790-1 rel. 1-1710 are amended by this IM.

Coordination: This IM was prepared in coordination with the Solicitor's Office and the Deputy State Directors of all state offices except Alaska and Eastern States.

Contact(s): Richard Mayberry, Rangeland Management Specialist, Division of Forest, Rangeland, Riparian, and Plant Conservation, at (202) 912-7229.

Signed by: _____ Authenticated by: _____

Michael H. Tupper
Acting, Assistant Director
Resources and Planning

Robert M. Williams
Division of IRM Governance, WO-860

Last updated: 07-23-2015

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by striking “the rate” and all that follows through the period at the end of the sentence and inserting “a rate equal to the sum of the Federal short-term rate determined under section 6621(b) of the Internal Revenue Code of 1986 plus 1 percentage point.”

SEC. 3022. INTERNET-BASED ONSHORE OIL AND GAS LEASE SALES.

(a) **AUTHORIZATION.**—Section 17(b)(1) of the Mineral Leasing Act (30 U.S.C. 226(b)(1)) is amended—

(1) in subparagraph (A), in the third sentence, by inserting “, except as provided in subparagraph (C)” after “by oral bidding”; and

(2) by adding at the end the following:

“(C) In order to diversify and expand the Nation’s onshore leasing program to ensure the best return to the Federal taxpayer, reduce fraud, and secure the leasing process, the Secretary may conduct onshore lease sales through Internet-based bidding methods. Each individual Internet-based lease sale shall conclude within 7 days.”

(b) **REPORT.**—Not later than 90 days after the tenth Internet-based lease sale conducted under the amendment made by subsection (a), the Secretary of the Interior shall analyze the first 10 such lease sales and report to Congress the findings of the analysis. The report shall include—

(1) estimates on increases or decreases in such lease sales, compared to sales conducted by oral bidding, in—

- (A) the number of bidders;
- (B) the average amount of bid;
- (C) the highest amount bid; and
- (D) the lowest bid;

(2) an estimate on the total cost or savings to the Department of the Interior as a result of such sales, compared to sales conducted by oral bidding; and

(3) an evaluation of the demonstrated or expected effectiveness of different structures for lease sales which may provide an opportunity to better maximize bidder participation, ensure the highest return to the Federal taxpayers, minimize opportunities for fraud or collusion, and ensure the security and integrity of the leasing process.

SEC. 3023. GRAZING PERMITS AND LEASES.

Section 402 of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1752) is amended—

(1) in subsection (c)—

(A) by redesignating paragraphs (1), (2), and (3) as subparagraphs (A), (B), and (C), respectively;

(B) by striking “So long as” and inserting the following:

“(1) **RENEWAL OF EXPIRING OR TRANSFERRED PERMIT OR LEASE.**—During any period in which”; and

(C) by adding at the end the following:

“(2) **CONTINUATION OF TERMS UNDER NEW PERMIT OR LEASE.**—The terms and conditions in a grazing permit or lease that has expired, or was terminated due to a grazing preference transfer, shall be continued under a new permit or lease until the date on which the Secretary concerned completes any environmental analysis and documentation for the permit or lease required under the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.) and other applicable laws.

“(3) COMPLETION OF PROCESSING.—As of the date on which the Secretary concerned completes the processing of a grazing permit or lease in accordance with paragraph (2), the permit or lease may be canceled, suspended, or modified, in whole or in part.

“(4) ENVIRONMENTAL REVIEWS.—The Secretary concerned shall seek to conduct environmental reviews on an allotment or multiple allotment basis, to the extent practicable, if the allotments share similar ecological conditions, for purposes of compliance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.) and other applicable laws.”;

(2) by redesignating subsection (h) as subsection (j); and

(3) by inserting after subsection (g) the following:

“(h) NATIONAL ENVIRONMENTAL POLICY ACT OF 1969.—

“(1) IN GENERAL.—The issuance of a grazing permit or lease by the Secretary concerned may be categorically excluded from the requirement to prepare an environmental assessment or an environmental impact statement under the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.) if—

“(A) the issued permit or lease continues the current grazing management of the allotment; and

“(B) the Secretary concerned—

“(i) has assessed and evaluated the grazing allotment associated with the lease or permit; and

“(ii) based on the assessment and evaluation under clause (i), has determined that the allotment—

“(I) with respect to public land administered by the Secretary of the Interior—

“(aa) is meeting land health standards;

or

“(bb) is not meeting land health standards due to factors other than existing livestock grazing; or

“(II) with respect to National Forest System land administered by the Secretary of Agriculture—

“(aa) is meeting objectives in the applicable land and resource management plan; or

“(bb) is not meeting the objectives in the applicable land resource management plan due to factors other than existing livestock grazing.

“(2) TRAILING AND CROSSING.—The trailing and crossing of livestock across public land and National Forest System land and the implementation of trailing and crossing practices by the Secretary concerned may be categorically excluded from the requirement to prepare an environmental assessment or an environmental impact statement under the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.).

“(i) PRIORITY AND TIMING FOR COMPLETION OF ENVIRONMENTAL ANALYSES.—The Secretary concerned, in the sole discretion of the Secretary concerned, shall determine the priority and timing for completing each required environmental analysis with respect to a grazing allotment, permit, or lease based on—

UNITED STATES DEPARTMENT OF THE INTERIOR
 BUREAU OF LAND MANAGEMENT
 WASHINGTON, D.C. 20240
<http://www.blm.gov>

July 15, 2015

In Reply Refer To:
 4110 (220) P

EMS TRANSMISSION 07/15/2015
 Instruction Memorandum No. 2015-121
 Expires 09/30/2018

To: All Field Office Officials

From: Assistant Director Resources and Planning

Subject: Implementing Amended Section 402(h)(1) of Federal Land Policy and Management Act - Using a Categorical Exclusion when Issuing a Grazing Permit or Lease

Program Area: Rangeland Management (1020).

Purpose: Section 3023 of Public Law (PL) 113-291, National Defense Authorization Act (NDAA) 2015, amends Section 402 of the Federal Land Policy and Management Act of 1976 (FLPMA) and includes seven provisions related to livestock grazing. This Instruction Memorandum (IM) is intended to provide interim guidance for applying a categorical exclusion (CX) to an environmental review of a grazing permit, pending incorporation into Handbook H-4130-1, Authorizing Grazing Use.

Policy/Action: The Authorized Officer (AO) may apply a CX to issue a grazing permit or lease (permit) for allotments that meet specified criteria in accordance with Section 402(h)(1) of FLPMA. Application of this CX is discretionary, not mandatory and may be used to manage permit administration workload. This guidance provides direction for applying the CX authorized in Section 402(h)(1) of the FLPMA (as amended). For general guidance on the use of a CX, please refer to the Departmental regulations at 43 CFR §§ 46.205 through 46.215, the BLM National Environmental Policy Act (NEPA) Handbook (H-1790-1), and the Departmental Manual at 516 DM 11. The application of this CX does not reduce or eliminate regulatory requirements or other program-specific policies including the obligation to issue a decision that would provide opportunities for interested parties or the public to protest and/or appeal the decision.

The criteria listed in the FLPMA Section 402(h)(1) must be met in order to apply the CX for issuing livestock grazing permits. These criteria are shown in Attachment 1. If the criteria are met and the AO chooses to apply the CX, follow the steps below to complete processing the application and issue the permit.

- 1) Ensure existing grazing is consistent with land use plan and any applicable allotment management plan objectives and decisions.

Use the most recent Evaluation Report(s) and Land Health Determination(s) and any subsequently collected monitoring data to document that the allotment(s) included in the permit meet land health standards or that factors other than existing livestock grazing are the cause for allotment(s) failing to meet the standards.

- 2) Review the 12 extraordinary circumstances in 43 CFR 46.215. Include in the case file a brief rationale as to why this CX applies.
- 3) Ensure that other legal and regulatory requirements, such as appropriate tribal and Endangered Species Act consultation are complete.
- 4) Consult and coordinate with affected permittees or lessees, the state agencies having lands or responsibility for managing resources within the area, and the interested public. A letter informing parties of the intent to continue existing grazing management and describing how the allotments qualify in accordance with the statutory requirements is appropriate.
- 5) Follow the decision processes provided in 43 CFR 4160 to issue the proposed and final decisions.
- 6) Upon completion of any administrative review of the decision documents, issue the grazing permit and document in the Rangeland Administration System (RAS) that the permit is processed.

The grazing permit CX may be used when a new permit/lease is issued as the result of a transfer or when a permit/lease has expired and a new permit/lease is being issued to that same permittee. This CX is an optional tool that may be used to satisfy the NEPA compliance requirement. It may be used at the AO's discretion only when a grazing permit/lease being considered meets the statutory criteria noted in Attachment 1. An AO may choose not to use the CX if he or she finds that a more detailed NEPA document such as an Environmental Assessment (EA) is needed to inform the decision to issue the permit/lease. If the AO determines that the grazing permit or lease being considered does not meet the statutory criteria, the CX must not be used. If a review or the 12 extraordinary circumstances listed in 43 CFR 46.215 determines that one or more of the extraordinary circumstances exists, this CX must not be used.

Background: Section 3023 in Public Law 113-291 *Carl Levin and Howard P. "Buck" McKeon National Defense Authorization Act for Fiscal Year 2015* amended Section 402 of FLPMA by modifying one provision and adding six new provisions. One of the new provisions in the amended text now included in FLPMA as Sec. 402(h)(1) states "NATIONAL ENVIRONMENTAL POLICY ACT OF 1969.—The issuance of a grazing permit or lease by the Secretary concerned may be categorically excluded from the requirement to prepare an environmental assessment or environmental impact statement under the National Environmental Policy Act of 1969 (42 U.S.C. et seq.)" There are specific criteria for the use of this CX listed in Section 402 (h) (1). These are shown in Attachment 1.

Timeframe: This policy is effective immediately.

Budget Impact: It is anticipated that this CX may be applied to 15 to 20 percent of allotments for the purpose of issuing grazing permits, however, the BLM is not establishing a quota or target for its use. A similar CX in effect during fiscal years 2008 and 2009 was applied to about 20 percent of the permits processed in those two years.

Manual/Handbook Sections Affected: This IM amends the Management Policy for Lands under Wilderness Review (H-8550-1), the National Environmental Policy Handbook 1790-1, rel. 1-1710, and Authorizing Grazing Use Handbook 4130-1, rel. 4-75.

Coordination: This IM was prepared in coordination with the Division of Decision Support, Planning and NEPA; and with the Solicitor's Office.

Contacts: Richard Mayberry, Rangeland Management Specialist, Division of Forest, Rangeland, Riparian, and Plant Conservation, at 202-912-7229.

Signed by:
 Michael H. Tupper
 Acting, Assistant Director
 Resources and Planning

Authenticated by:
 Robert M. Williams
 Division of IRM Governance, WO-860

1 Attachment

1 - FLPMA Sect on 402(h)(1) Criteria for Applicat on of Categorical Exclus on used to Issue a Grazing Permit or Lease (1 p)

Last updated: 07-21-2015

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From: Travis Bargsten
To: [My-Linh Le](#)
Cc: [Andrea Weber](#); [Wendy Park](#); [Michael Saul](#); [Michael Madrid](#); [Christopher Hite](#)
Subject: RE: Center for Biological Diversity et al. Protest re August 2016 Oil and Gas Lease Sale
Date: Friday, June 3, 2016 1:28:40 PM

Good morning My-Linh;

Andrea may have shared with you the e-mail I sent to her on May 24th in response to a similar question. I've excerpted the relevant portions, below:

"As you probably know, the Notice of Competitive Oil and Gas Lease Sale <<https://eplanning.blm.gov/epl-front-office/projects/nepa/61292/73465/80674/08list.pdf>> for the August 2, 2016 sale explains:

"We must receive a protest no later than 4:00 p m. local time on June 3, 2016, the 60th calendar day prior to the date of the sale. If our office is not open on the 60th day prior to the date of the sale, a protest received on the next day our office is open to the public will be considered timely filed. The protest must also include any statement of reasons to support the protest. We will dismiss a late-filed protest or a protest filed without a statement of reasons."

This includes all supporting information, such as cited references, that you wish the BLM to consider in responding to the protest.

So, while a protest successfully faxed to the number provided in the Notice by 4:00 pm on June 3rd would be considered timely received by the BLM (we recommend that parties faxing their protest also follow up with the BLM by telephone to confirm that all pages were received), any written materials not included in the faxed protest and not received by the 4:00 pm deadline would not be timely filed.

Please understand that the BLM's ability to accept materials (even cited references) after the deadline is limited and not subject to my discretion."

If you have any questions, please let us know.

Regards,

Travis Bargsten

Physical Scientist

BLM – Wyoming State Office

307-775-6197

From: My-Linh Le [<mailto:MLLe@biologicaldiversity.org>]
Sent: Friday, June 03, 2016 10:42 AM
To: t75bargs@blm.gov

Cc: 'Andrea Weber'; Wendy Park; Michael Saul

Subject: Center for Biological Diversity et al. Protest re August 2016 Oil and Gas Lease Sale

Dear Mr. Bargsten,

We submitted a protest yesterday via fax on behalf of the Center for Biological Diversity, Friends of the Earth, Great Old Broads for the Wilderness, and Sierra Club regarding the August 2016 Oil and Gas Lease Sale. I'm told that the fax went through so the protest letter was timely received. Unfortunately due to an unforeseen change in Fed Ex's pick-up time, we were not able to mail out the CD of documents cited in our letter in time to arrive today.

Please let me know if BLM will consider the CD of referenced documents timely submitted if we Fed Ex overnight priority today (in which case you would receive it by Monday). If not, I will attempt to fax over all of the cited studies/reports today, which amount to more than 2,300 pages.

Please advise on which BLM prefers us to do, thank you.

Sincerely,

My-Linh Le

Center for Biological Diversity

1212 Broadway, Suite 800

Oakland, CA 94612

Phone (510) 844-7100

Fax (510) 844-7150

mylle@biologicaldiversity.org <<mailto:aweber@biologicaldiversity.org>>

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From: Spotts, Richard
To: [Susan Crook](#); [Tom Butine](#); [janewhalen@earthlink.net](#); [Arthur Haines](#); [utahsmalls@msn.com](#); [Kathleen Harcksen](#); [eyork@tnc.org](#); [lisar@bajabb.com](#); [Chris Gorzalski](#); [kim@grandcanyonwildlands.org](#); [kelly@grandcanyonwildlands.org](#); [Kelsey Johnson](#); [mark.clemens@sierraclub.org](#); [utah.chapter@sierraclub.org](#); [erickson_steve1@comcast.net](#); [michael@glencanyon.org](#); [Phil Hanceford](#); [nada_culver@tws.org](#); [megan_dickie@tws.org](#); [scott@suwa.org](#); [neal@suwa.org](#); [Deeda Seed](#); [Roger Clark](#); [eaumack@grandcanyontrust.org](#); [Tim Peterson](#); [mobrien@grandcanyontrust.org](#); [Utah Native Plant Society](#); [wildutah@xmission.com](#); [friendsofgoldbutte@gmail.com](#); [Carolyn Borg](#); [Ed LaRue](#)
Subject: FYI - Decades-old memories key to rural roads lawsuit
Date: Friday, June 10, 2016 10:23:26 AM

FYI - If you have not already seen it, you may find the article below of interest. Btw, after today, there will be a two-week break in my FYI emails as I will be in Europe for my daughter's wedding. RS

<http://www.thespectrum.com/story/news/2016/06/09/decades-old-memories-key-rural-roads-lawsuit/85671948/>

Decades-old memories key to rural roads lawsuit



[David DeMille](#), ddemille@thespectrum.com 8:32 p.m. MDT June 9, 2016



The view to the north from the upper section section of The Vortex Trail in the Red Mountain Wilderness.(Photo: Tom Garrison / For The Spectrum & Daily News)

Forty years after Congress enacted the Federal Land Policy Management Act and sparked a battle over public lands and access that has raged ever since, attorneys across the West are rushing to gather key testimony before they lose their witnesses to old age.

Officials in Washington County announced this week they would be soliciting help from residents in documenting historic use of some of the dirt roads that criss-cross the area's more than 600,000 acres of public lands.

They announced a pair of open house-style meetings for June 21 and June 23, inviting potential witnesses to attend.

"We're losing a lot of people. We've already lost a lot of people," said Commissioner Alan Gardner.

Anyone interested should be at least 60 years old and have memories of whether local roads were used or not before 1976 — the roads would have to have been used continuously for at least 10 consecutive years to qualify for protection.

Witnesses should also be willing to share their memories as part of an ongoing lawsuit between the county and the U.S. government, according to a news release from the three-member county commission.

In total, the local governments can collect testimony from 300 people statewide, according to an order filed last week by District Court Judge Clark Waddoups.

In 2012, Utah and a number of mostly rural counties filed more than two dozen lawsuits attempting to have more than 12,000 roads designated as recognized RS-2477 "highways," with access advocates arguing a roadway's historic use invalidates claims that the surrounding lands could be protected under federal wilderness designations.

At stake is more than just motor vehicle access.

So-called RS-2477 roads — named after a Civil War-era law called Revised Statute 2477 — also have the potential to limit the designation of wilderness areas in the lands they cross, providing access for oil and gas companies, for uranium prospectors and utility lines.

Pointing to language in the Wilderness Act of 1964, which states that any area to be considered for wilderness status must contain at least 5,000 acres of land and not include any permanent roads, advocates across the West have argued that the roadways could be used to block unwanted wilderness designations.

If an RS-2477 roadway is considered a permanent road it could bisect an area and drop it below the 5,000-acre limit, or at least that's how the thinking goes.

Conservation groups argue such "hoax highways" often amount to little more than dirt trails or washes and shouldn't be used to subject wilderness areas to mining operations and other development.



Buy

Photo

The hike to Utah's lowest spot features cottonwood trees and more growing along the Beaver Dam Wash. (Photo: Jud Burkett / The Spectrum & Daily News)

Joe Bushyhead, staff attorney with the Southern Utah Wilderness Alliance, said the lawsuit seeks to turn even small two-track dirt roads, trails and wash bottoms into 66-foot rights of way — a designation that could then be used to cut off federal protections to some of the areas most cherished scenic areas.

Roadway claims in Washington County cut through parts of the Red Mountain Wilderness area, the Beaver Dam Wash National Conservation Area and the Canaan Mountain Wilderness, among others.

“This litigation is just one front in the State of Utah’s ‘land grab’ efforts to wrest title to public lands from the federal government,” he said.

The June 21 open house meeting is scheduled for 6 p.m. to 8 p.m. at the Washington County Commission chambers, 197 E. Tabernacle Street in St. George.

The June 23 meeting is slated for 6 p.m. to 8 p.m. at the Hurricane branch of the Washington County Library, 36 S. 300 West in Hurricane.

Follow reporter David DeMille on Twitter, [@SpectrumDeMille](https://twitter.com/SpectrumDeMille), and on Facebook at www.facebook.com/SpectrumDeMille. Call him at 435-674-6261.

From: Yannone, Kristin
To: [BLM_WY_LRMP_WYMail](#)
Subject: Public Meeting for the Johnny Behind the Rock mineral withdrawal and pending NEPA documents
Date: Friday, June 10, 2016 2:51:43 PM
Attachments: [FRN 6-10-16.pdf](#)
[Pending Lander NEPA 6-2016.docx](#)

Attached is a list of NEPA (National Environmental Policy Act) projects pending in the Lander Field Office.

Also attached is a copy of the Federal Register Notice that was published today announcing a proposed withdrawal of approximately 5,000 acres from locatable mineral entry (hard rock mining) for the Johnny Behind the Rock Recreation Management Zone. JBR is an off-road, non-motorized recreation area approximately 12 miles south east of the City of Lander. The development of a trail system has been strongly supported by the Lander Cycling Club and the International Mountain Biking Association.

The 2014 Lander Resource Management Plan made JBR no surface occupancy for oil and gas and closed to motorized vehicles. The process to exclude development of uranium, gold, bentonite, rare earth elements and other types of locatable minerals requires a "withdrawal" and must be signed by the Secretary of the Interior (or her designee). The 2014 RMP proposed JBR for withdrawal but the attached notice and subsequent secretarial action are required steps for the withdrawal to take effect.

I know that you've been inundated with email messages since I have started the public notification list. I do not expect to be contacting you nearly so often moving forward.

Please feel free to tell me to remove your name from the list any time you like.

--

Kristin Yannone
Planner
Lander Field Office
Bureau of Land Management
1335 Main Street
Lander, Wyoming 82520
307-332-8448
Fax: 307-332-2318
Cell: 213-219-2615

tings or invalid file format do not permit using 2016-06-10 14_51_43 Yannone, Kristin - Public Meeting for the Jo (1).pdf (195

Pending Lander, Wyoming Field Office NEPA

June 10, 2016

The following are the National Environmental Policy Act (NEPA) projects that are in process in the Lander Field Office. The project webpages can be accessed at the ePlanning website found at: <http://www.blm.gov/wy/st/en/info/NEPA/documents.html>. Information about large NEPA projects in Wyoming is contained in the "Hot Sheet" document under "Frequently Requested" tab on the BLM public page: <http://www.blm.gov/wy/st/en.html>.

Pesticide Use Permits (PUPs)

WDEQ NEPA No. DOI-BLM0WY-R050-2016-0029-DNA
Denbury NEPA No. DOI-BLM0WY-R050-2016-0030-DNA
ZLE PUP NEPA No. DOI-BLM0WY-R050-2016-0020-DNA

Livestock Grazing Permit Renewals

Flagg Individual NEPA No. DOI-BLM0WY-R050-2016-0036-CX
Small Sweetwater Private Allotments NEPA No. DOI-BLM0WY-R050-2016-0004-CX
Atlantic City Fenced Allotments NEPA No. DOI-BLM0WY-R050-2016-0005-CX

Livestock Grazing Infrastructure

Shelley Seep Range Pipeline (on hold) NEPA No. DOI-BLM0WY-R050-2016-0006-EA

Juniper/Fuels Treatment

Copper Mountain Fuels Reduction NEPA No. DOI-BLM0WY-R050-2016-0008-EA
Tin Cup Mountain Juniper Treatment

Mining Related Projects

UMETCO: three additional water monitoring wells
Gunyon-Mike Placer Plan of Operations NEPA No. DOI-BLM0WY-R050-2016-0032-EA

Oil and Gas

February 2017 Leasing NEPA No. DOI-BLM0WY-R050-2016-0002-EA
Expired lease reinstatements NEPA No. DOI-BLM0WY-R050-2016-0003-EA
Grieve 55 Notice of Staking NEPA No. DOI-BLM0WY-R050-2016-0013-EA
Ladysmith 8-20 EA NEPA No. DOI-BLM0WY-R050-2016-0017-EA

Renewals and Re-issuance of Pipelines

Sand Draw to Casper Pipeline renewals NEPA No. DOI-BLM-WY-R050-2016-0035-EA
Energy Fuels Temporary Use Permit NEPA No. DOI-BLM-WY-R050-2016-0027-DNA
Aethon renewal of temporary pipelines NEPA No. DOI-BLM-WY-R050-2016-0022-DNA
Iron Horse ROW needed because of unit contraction NEPA No. DOI-BLM-WY-R050-2016-0035-EA
Aethon ROW needed because of unit contraction NEPA No. DOI-BLM-WY-R050-2016-0024-DNA

Large Scale Projects

Lander has the lead on the Moneta Divide EIS involving the Lander and Casper field offices. The Riley Ridge to Natrona Pipeline project proposes crossing through the Lander Field Office. Both of these EISs are in the drafting stage with no identified date for release of the draft EISs. Information regarding these projects are available on their webpages:

Moneta Divide: <http://www.blm.gov/wy/st/en/info/NEPA/documents/lfo/moneta-divide.html>

Riley Ridge: <http://www.blm.gov/wy/st/en/info/NEPA/documents/rsfo/RRNP.html>

LFO is close to releasing a final EIS for the Sheep Mountain Uranium Project (the Federal Register Notice is being reviewed by the Washington Office). The draft EIS is available at:
<http://www.blm.gov/wy/st/en/info/NEPA/documents/lfo/sheepmtn.html>.

The Rawlins Field Office is in the process of preparing an EIS for an expansion of the Lost Creek Uranium Project. None of the proposed new disturbance is in the Lander Field Office but material from the expanded area would be processed at the existing facility which is located in the Lander Field Office. Information about this project is available at:
<http://www.blm.gov/wy/st/en/info/NEPA/documents/rfo/lostcreek.html>.

Response: We thank the ANILCA Implementation Program for their comments. Throughout survey development, we conducted interviews with stakeholders to address key concerns and issues to be addressed in the survey. This included the Alaska Department of Fish and Game area biologist for the Kodiak Archipelago, the Kodiak Brown Bear Center (owned and operated by the Koniag Native Corporation), and commercial air taxi operators and guides. We sincerely appreciate the insights from all of these groups. Unfortunately, surveying all refuge visitors is not within financial and time feasibility of the current study. While hunting and fishing patterns are well understood due to the purchase of licenses and close regulation in partnership with the State of Alaska, an equally detailed understanding of bear viewing activity and satisfaction is lacking, making it the current priority for social science research. Finally, the primary survey is being conducted online instead of onsite due to affordability, logistics (weather on Kodiak is often not conducive to sitting outside for 10–20 minutes to complete a printed survey in wind and rain), and proven success with past online surveys. Our intent is to minimize onsite burden hours for visitors traveling from around the world for expensive and sometimes short viewing experiences.

Request for Public Comments

We again invite comments concerning this information collection on:

- Whether or not the collection of information is necessary, including whether or not the information will have practical utility;
- The accuracy of our estimate of the burden for this collection of information;
- Ways to enhance the quality, utility, and clarity of the information to be collected; and
- Ways to minimize the burden of the collection of information on respondents.

Comments that you submit in response to this notice are a matter of public record. Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment, including your personal identifying information, may be made publicly available at any time. While you can ask OMB and us in your comment to withhold your personal identifying information from public review, we cannot guarantee that it will be done.

Dated: June 7, 2016.

Tina A. Campbell,

Chief, Division of Policy, Performance, and Management Programs, U.S. Fish and Wildlife Service.

[FR Doc. 2016–13750 Filed 6–9–16; 8:45 am]

BILLING CODE 4333–15–P

DEPARTMENT OF THE INTERIOR

Bureau of Land Management

[LLWYR05000.L16100000.XP0000; WYW 168593]

Notice of Proposed Withdrawal and Notification of a Public Meeting for the Johnny Behind the Rocks Recreation Zone, Wyoming

AGENCY: Bureau of Land Management, Interior.

ACTION: Notice.

SUMMARY: On behalf of the Bureau of Land Management (BLM), the Assistant Secretary for Land and Minerals Management proposes to withdraw, subject to valid existing rights, 4,964.75 acres of public land from location and entry under the United States mining laws, but not from leasing under the mineral or geothermal leasing laws, for a period of 20 years. The proposed withdrawal is needed to protect cultural and recreational resources of the Johnny Behind the Rocks Recreation Zone in Fremont County, Wyoming. This notice temporarily segregates the land for up to 2 years from location and entry under the United States mining laws, while the application is processed. This notice also gives an opportunity to comment on the proposed withdrawal, and announces a public meeting date, time, and location.

DATES: Comments on the proposed withdrawal must be received on or before September 8, 2016. A public meeting will be held on July 25, 2016.

ADDRESSES: Please mail or hand deliver all comments concerning the proposed withdrawal to Kristin Yannone, Planner, BLM Lander Field Office, 1335 Main, Lander, Wyoming, 82520.

The public meeting will be held at the Fremont County Library, 220 North 2nd Street, Lander, Wyoming.

FOR FURTHER INFORMATION CONTACT: Kristin Yannone, Planner, by mail at the BLM Lander Field Office, 1335 Main Street, Lander, Wyoming, 82520; by phone at 307–332–8400; or by email at kyannone@blm.gov. Persons who use a telecommunications device for the deaf may call the Federal Information Relay Service (FIRS) at 800–877–8339 to contact Ms. Yannone. The FIRS is available 24 hours a day, seven days a

week, to leave a message or question with the above individual. You will receive a reply during normal business hours.

SUPPLEMENTARY INFORMATION: The BLM filed an application requesting the Assistant Secretary for Land and Minerals Management withdraw, subject to valid existing rights, the following described public land from location and entry under the United States mining laws, but not from leasing under the mineral or geothermal leasing laws, to protect the cultural and recreational resources of the Johnny Behind the Rocks Recreation Zone:

Sixth Principal Meridian

T. 31 N., R. 98 W.,

Sec. 3, lots 3 and 4;

Sec. 4, lot 1;

Sec. 5, lot 1.

T. 32 N., R. 98 W.,

Sec. 17, SW1/4, NW1/4SE1/4, and S1/2SE1/4;

Sec. 18, lots 9 thru 12, and SE1/4;

Sec. 19, lots 5 thru 10, and E1/2;

Sec. 20;

Sec. 21, SW1/4NW1/4, W1/2SW1/4, and SE1/4SW1/4;

Sec. 28, SW1/4NE1/4, W1/2, NW1/4SE1/4, and S1/2SE1/4;

Sec. 29;

Sec. 30, NE1/4;

Sec. 32, N1/2, NE1/4SW1/4, and SE1/4;

Sec. 33;

Sec. 34, SW1/4NW1/4, SW1/4, and W1/2SE1/4.

T. 32 N., R. 99 W.,

Sec. 13, E1/2SE1/4;

Sec. 24, SE1/4NE1/4.

The area described contains approximately 4,964.75 acres in Fremont County.

The Assistant Secretary for Land and Minerals Management approved the BLM's petition/application. Therefore, the petition/application constitutes a withdrawal proposal of the Secretary of the Interior (43 CFR 2310.1–3(e)).

The purpose of the proposed withdrawal is to protect the cultural and recreational resources of the Johnny Behind the Rocks Recreation Zone.

The use of a right-of-way, interagency, or cooperative agreement would not adequately constrain nondiscretionary uses which could result in permanent loss of significant values and irreplaceable resources.

There are no suitable alternative sites since the lands contain cultural and recreational resources that are unique to the area proposed for withdrawal.

No additional water rights will be needed to fulfill the purpose of the requested withdrawal.

Records relating to the application may be examined by contacting the BLM at the above addresses and phone numbers.

For a period until September 8, 2016, all persons who wish to submit comments, suggestions or objections in connection with the proposed withdrawal may present their views in writing to Kristin Yannone, Planner, BLM Lander Field Office, 1335 Main, Lander, Wyoming, 82520.

Comments, including names, street addresses and other contact information of respondents, will be available for public review at the BLM Lander Field Office during regular business hours, 8:00 a.m. to 4:30 p.m., Monday through Friday, except Federal holidays. Before including your address, phone number, email address, or other personal identifying information in your comment, be advised that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

A public meeting will be held on July 25, 2016, at the Fremont County Library, 220 North 2nd Street, Lander, Wyoming, from 4:30–5:30 p.m. A notice of the meeting will be published in at least one local newspaper no less than 30 days before the scheduled meeting date. Interested parties may make oral statements and may file written statements at the meeting.

For a period until June 11, 2018, the public land described in this notice will be segregated from location and entry under the United States mining laws, but not from leasing under the mineral or geothermal leasing laws, unless the application is denied or canceled or the withdrawal is approved prior to that date.

Licenses, permits, cooperative agreements or discretionary land use authorizations of a temporary nature that would not impact the site may be allowed with the approval of an authorized officer of the BLM during the temporary segregative period.

This withdrawal proposal will be processed in accordance with the regulations set forth in 43 CFR part 2300.

Michael G. Valle,

Acting BLM Wyoming State Director.

[FR Doc. 2016-13762 Filed 6-9-16; 8:45 am]

BILLING CODE 4310-22-P

DEPARTMENT OF THE INTERIOR

Bureau of Land Management

[LLCA930000.L1440000.EU0000.16XL1109AF; CACA 54031]

Notice of Realty Action: Direct Sale of Reversionary Interest in San Bernardino County, California

AGENCY: Bureau of Land Management, Interior.

ACTION: Notice.

SUMMARY: The Bureau of Land Management (BLM), Needles Field Office, proposes to sell the United States' reversionary interest in 2.31 acres of land in San Bernardino County, California to the City of Needles (City) at not less than fair market value in the amount of \$139,994. The land was conveyed out of Federal ownership in 1966 subject to a reversionary interest which is now proposed for sale under the authority of the Federal Land Policy and Management Act (FLPMA) of 1976, as amended.

DATES: Comments regarding the proposed sale must be received by the BLM on or before July 25, 2016.

ADDRESSES: You may submit written comments concerning the proposed sale to the Field Manager, BLM, Needles Field Office, 1303 South Highway 95, Needles, California 92363.

FOR FURTHER INFORMATION CONTACT: William Webster, Realty Specialist, BLM Needles Field Office, telephone 760-326-7006; address 1303 South Highway 95, Needles, California 92363. Persons who use a telecommunications device for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 1-800-877-8339 to contact the above individual during normal business hours. The FIRS is available 24 hours a day, 7 days a week, to leave a message or question with the above individual. You will receive a reply during normal business hours.

SUPPLEMENTARY INFORMATION: The reversionary interest in the following land is proposed for direct sale in accordance with Section 203 of the FLPMA, as amended (43 U.S.C. 1713).

San Bernardino Meridian, California

T. 9 N., R. 23 E., sec. 31, lot 6.

The area described contains 2.31 acres.

The area described above is part of 50 acres conveyed in 1966 to the City in patent 04-67-0018 under the authority of the Recreation and Public Purposes Act (R&PP Act) of June 14, 1926, as amended. The land was conveyed for park and recreational purposes for \$2.50 per acre. The United States (U.S.)

retained an interest in the land in which title could revert back to the U.S. if the land is not used for purposes authorized under the R&PP Act or if the land is transferred to another party without the BLM's approval. In 1971, the BLM approved a change in use to allow the City to construct the Needles Municipal Hospital on 2.31 acres of the land conveyed in patent 04-67-0018. In 2010, the voters of Needles approved Measure Q, which effectively required the City to sell the Needles Municipal Hospital to a qualified non-profit corporation. The sale has been complicated by the fact that the Needles Municipal Hospital is located on 2.31 acres owned by the City subject to the reversionary interest and approximately 3.36 acres owned by the City which is not subject to a reversionary interest. The City agreed to sell the land occupied by the Needles Municipal Hospital to Community Healthcare Partner, Inc., a non-profit corporation. The sale is contingent on the BLM selling the reversionary interest in the 2.31 acres of land occupied by the Needles Municipal Hospital so the City can convey the land free of any reversionary interest. The sale would allow for possible future commercial use of the 2.31 acres, including a for-profit hospital, and allow for future transfers of the land without the BLM's approval.

The reversionary interest in the 2.31 acres of land described above is proposed for sale to the City for \$139,994, which represents the appraised fair market value of \$140,000, less \$6.00 paid to the BLM to purchase the land in 1966. The reversionary interest is difficult and uneconomic to manage as part of the public lands because it is surrounded by private land and is not contiguous to any public land administered by the BLM. The BLM has concluded that a competitive sale is not appropriate and that the public interest would best be served by a direct sale to the City, which currently owns the land subject to the reversionary interest. The reversionary interest was not identified for sale in the 1980 California Desert Conservation Area (CDCA) Plan. On January 14, 2015, the BLM approved an amendment to the 1980 CDCA Plan, which identified the reversionary interest in the 50 acres conveyed to the City in 1966 in patent 04-67-0018 as suitable for sale pursuant to section 203 of FLPMA.

The reversionary interest would not be sold until at least August 9, 2016. Any conveyance document issued would convey only the reversionary interest retained by the U.S. in patent 04-67-0018 and would contain the

From: Nada Culver
To: scstewar@blm.gov
Cc: [Chase Huntley](#); [Pam Eaton](#); [Bruce Pendery](#)
Subject: USE THIE ONE RE: regulations regarding land use planning for coal
Date: Friday, June 10, 2016 6:54:04 PM
Attachments: [Land use planning requirements - coal.docx](#)

Hit send too soon! Sorry for any inconvenience.

Hi Shannon – Thank you for the time this past week. Following up on our conversation, I’m attaching a word document that has the 2 handy code of federal regulations sections addressing planning for coal.

43 C.F.R. § 3420.1-4 (General requirements for land use planning) addresses the process specifically and subsection (e) lays out the 4 steps of looking at potential, unsuitability, other multiple use requirements and coordination with surface owners.

43 C.F.R. § 3461.5 (Criteria for assessing lands unsuitable for all or certain stipulated methods of coal mining) sets out the “unsuitability criteria.”

I hope it’s helpful to have then in one document.

Nada Culver

Senior Counsel and Director, BLM Action Center

The Wilderness Society

1660 Wynkoop, #850

Denver, CO 80202

Main: 303-650-5818

Direct: 303-225-4635

Nada_Culver@tws.org

§ 3420.1-4 General requirements for land use planning.

(a) The Secretary may not hold a lease sale under this part unless the lands containing the coal deposits are included in a comprehensive land use plan or land use analysis. The land use plan or land use analysis will be conducted with public notice and opportunity for participation at the points specified in § 1610.2(f) of this title. The sale must be compatible with, and subject to, any relevant stipulations, guidelines, and standards set out in that plan or analysis.

(b)

(1) The Bureau of Land Management shall prepare comprehensive land use plans and land use analyses for lands it administers in conformance with 43 CFR part 1600.

(2) The Department of Agriculture or any other Federal agency with surface management authority over lands subject to leasing shall prepare comprehensive land use plans or land use analyses for lands it administers.

(3) The Secretary may lease in any area where it is found either that there is no Federal interest in the surface or that the coal deposits in an area are insufficient to justify the costs of a Federal land use plan upon completion of a land use analysis in accordance with this section and 43 CFR part 1600.

(c) In an area of Federal lands not covered by a completed comprehensive land use plan or scheduled for comprehensive land use planning, a member of the public may request the appropriate Bureau of Land Management State Office to prepare a land use analysis for coal related uses of the land as provided for in this group.

(d) A comprehensive land use plan or land use analysis shall contain an estimate of the amount of coal recoverable by either surface or underground mining operations or both.

(e) The major land use planning decision concerning the coal resource shall be the identification of areas acceptable for further consideration for leasing which shall be identified by the screening procedures listed below:

(1) Only those areas that have development potential may be identified as acceptable for further consideration for leasing. The Bureau of Land Management shall estimate coal development potential for the surface management agency. Coal companies, State and local governments and the general public are encouraged to submit information to the Bureau of Land Management at any time in connection with such development potential determinations. Coal companies, State and local governments and members of the general public may also submit nonconfidential coal geology and economic data during the inventory phase of planning to the surface management agency conducting the land use planning. Where such information is determined to indicate development potential for an area, the area may be included in the land use planning for evaluation for coal leasing.

(2) The Bureau of Land Management or the surface managing agency conducting the land use planning shall, using the unsuitability criteria and procedures set out in subpart 3461 of this title, review Federal lands to assess where there are areas unsuitable for all or certain stipulated methods of mining. The unsuitability assessment shall be consistent with any decision of the Office of Surface Mining Reclamation and Enforcement to designate lands unsuitable or to terminate a designation in response to a petition.

(3) Multiple land use decisions shall be made which may eliminate additional coal deposits from further consideration for leasing to protect other resource values and land uses that are locally, regionally or nationally important or unique and that are not included in the unsuitability criteria discussed in paragraph (e) of this section. Such values and uses include, but are not limited to, those identified in section 522(a)(3) of the Surface Mining Reclamation and Control Act of 1977 and as defined in 30 CFR 762.5. In making these multiple use decisions, the Bureau of Land Management or the surface management agency conducting the land use planning shall place particular emphasis on protecting the following: Air and water quality; wetlands, riparian areas and sole-source aquifers; the Federal lands which, if leased, would adversely impact units of the National Park System, the National Wildlife Refuge System, the National System of Trails, and the National Wild and Scenic Rivers System.

(4)

(i) While preparing a comprehensive land use plan or land use analysis, the Bureau of Land Management shall consult with all surface owners who meet the criteria in paragraphs (gg) (1) and (2) of § 3400.0-5 of this title, and whose lands overlie coal deposits, to determine preference for or against mining by other than underground mining techniques.

(ii) For the purposes of this paragraph, any surface owner who has previously granted written consent to any party to mine by other than underground mining techniques shall be deemed to have expressed a preference in favor of mining. Where a significant number of surface owners in an area have expressed a preference against mining those deposits by other than underground mining techniques, that area shall be considered acceptable for further consideration only for development by underground mining techniques. In addition, the area may be considered acceptable for further consideration for leasing for development by other than underground techniques if there are no acceptable alternative areas available to meet the regional leasing level.

(iii) An area eliminated from further consideration by this subsection may be considered acceptable for further consideration for leasing for mining by other than underground mining techniques if:

(A) The number of surface owners who have expressed their preference against mining by other than underground techniques is reduced below a significant number because such surface owners have given written consent for such mining or have transferred ownership to unqualified surface owners; and

(B) The land use plan is amended accordingly.

(f) In its review of cumulative impacts of coal development, the regional coal team shall consider any threshold analysis performed during land-use planning as required by § 1610.4-4 of this title and shall apply this analysis, where appropriate, to the region as a whole.

§ 3461.5 Criteria for assessing lands unsuitable for all or certain stipulated methods of coal mining.

(a)

(1) **Criterion Number 1.** All Federal lands included in the following land systems or categories shall be considered unsuitable: National Park System, National Wildlife Refuge System, National System of Trails, National Wilderness Preservation System, National Wild and Scenic Rivers System, National Recreation Areas, lands acquired with money derived from the Land and Water Conservation Fund, National Forests, and Federal lands in incorporated cities, towns, and villages.

(2) **Exceptions.**

(i) A lease may be issued within the boundaries of any National Forest if the Secretary finds no significant recreational, timber, economic or other values which may be incompatible with the lease; and (A) surface operations and impacts are incident to an underground coal mine, or (B) where the Secretary of Agriculture determines, with respect to lands which do not have significant forest cover within those National Forests west of the 100th Meridian, that surface mining may be in compliance with the Multiple-Use Sustained-Yield Act of 1960, the Federal Coal Leasing Amendments Act of 1976 and the Surface Mining Control and Reclamation Act of 1977.

(ii) A lease may be issued within the Custer National Forest with the consent of the Department of Agriculture as long as no surface coal mining operations are permitted.

(3) **Exemptions.** The application of this criterion to lands within the listed land systems and categories is subject to valid existing rights, and does not apply to surface coal mining operations existing on August 3, 1977.

(b)

(1) **Criterion Number 2.** Federal lands that are within rights-of-way or easements or within surface leases for residential, commercial, industrial, or other public purposes, on federally owned surface shall be considered unsuitable.

(2) **Exceptions.** A lease may be issued, and mining operations approved, in such areas if the surface management agency determines that:

- (i) All or certain types of coal development (e.g., underground mining) will not interfere with the purpose of the right-of-way or easement; or
 - (ii) The right-of-way or easement was granted for mining purposes; or
 - (iii) The right-of-way or easement was issued for a purpose for which it is not being used; or
 - (iv) The parties involved in the right-of-way or easement agree, in writing, to leasing; or
 - (v) It is impractical to exclude such areas due to the location of coal and method of mining and such areas or uses can be protected through appropriate stipulations.
- (3) Exemptions.** This criterion does not apply to lands: To which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(c)

(1) Criterion Number 3. The terms used in this criterion have the meaning set out in the Office of Surface Mining Reclamation and Enforcement regulations at Chapter VII of Title 30 of the Code of Federal Regulations. Federal lands affected by section 522(e) (4) and (5) of the Surface Mining Control and Reclamation Act of 1977 shall be considered unsuitable. This includes lands within 100 feet of the outside line of the right-of-way of a public road or within 100 feet of a cemetery, or within 300 feet of any public building, school, church, community or institutional building or public park or within 300 feet of an occupied dwelling.

(2) Exceptions. A lease may be issued for lands:

- (i) Used as mine access roads or haulage roads that join the right-of-way for a public road;
- (ii) For which the Office of Surface Mining Reclamation and Enforcement has issued a permit to have public roads relocated;
- (iii) If, after public notice and opportunity for public hearing in the locality, a written finding is made by the authorized officer that the interests of the public and the landowners affected by mining within 100 feet of a public road will be protected.
- (iv) For which owners of occupied dwellings have given written permission to mine within 300 feet of their buildings.

(3) Exemptions. The application of this criterion is subject to valid existing rights, and does not apply to surface coal mining operations existing on August 3, 1977.

(d)

(1) Criterion Number 4. Federal lands designated as wilderness study areas shall be considered unsuitable while under review by the Administration and the Congress for possible wilderness designation. For any Federal land which is to be leased or mined prior to completion of the wilderness inventory by the surface management agency, the environmental assessment or impact statement on the lease sale or mine plan shall consider whether the land possesses the characteristics of a wilderness study area. If the finding is affirmative, the land shall be considered unsuitable, unless issuance of noncompetitive coal leases and mining on leases is authorized under the Wilderness Act and the Federal Land Policy and Management Act of 1976.

(2) Exemption. The application of this criterion to lands for which the Bureau of Land Management is the surface management agency and lands in designated wilderness areas in National Forests is subject to valid existing rights.

(e)

(1) Criterion Number 5. Scenic Federal lands designated by visual resource management analysis as Class I (an areas of outstanding scenic quality or high vessel sensitivity) but not currently on the National Register of Natural Landmarks shall be considered unsuitable.

(2) Exception. A lease may be issued if the surface management agency determines that surface coal mining operations will not significantly diminish or adversely affect the scenic quality of the designated area.

(3) Exemptions. This criterion does not apply to lands: to which the operator has made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977, or which include operations on which a permit has been issued.

(f)

(1) Criterion Number 6. Federal lands under permit by the surface management agency, and being used for scientific studies involving food or fiber production, natural resources, or technology demonstrations and experiments shall be considered unsuitable for the duration of the study, demonstration or experiment, except where mining could be conducted in such a way as to enhance or not jeopardize the purposes of the study, as determined by the surface management agency, or where the principal scientific user or agency gives written concurrence to all or certain methods of mining.

(2) Exemptions. This criterion does not apply to lands: To which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(g)

(1) Criterion Number 7. All publicly or privately owned places which are included in the National Register of Historic Places shall be considered unsuitable. This shall include any areas that the surface management agency determines, after consultation with the Advisory Council on Historic Preservation and the State Historic Preservation Officer, are necessary to protect the inherent values of the property that made it eligible for listing in the National Register.

(2) Exceptions. All or certain stipulated methods of coal mining may be allowed if, after consultation with the Advisory Council on Historic Preservation and the State Historic Preservation Officer, they are approved by the surface management agency, and, where appropriate, the State or local agency with jurisdiction over the historic site.

(3) Exemptions. This criterion does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(h)

(1) Criterion Number 8. Federal lands designated as natural areas or as National Natural Landmarks shall be considered unsuitable.

(2) Exceptions. A lease may be issued and mining operation approved in an area or site if the surface management agency determines that:

(i) The use of appropriate stipulated mining technology will result in no significant adverse impact to the area or site; or

(ii) The mining of the coal resource under appropriate stipulations will enhance information recovery (e.g., paleontological sites).

(3) Exemptions. This criterion does not apply to lands: To which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which includes operations on which a permit has been issued.

(i)

(1) Criterion Number 9. Federally designated critical habitat for listed threatened or endangered plant and animal species, and habitat proposed to be designated as critical for listed threatened or endangered plant and animal species or species proposed for listing, and habitat for Federal threatened or endangered species which is determined by the Fish and Wildlife Service and the surface management agency to be of essential value and where the presence of threatened or endangered species has been scientifically documented, shall be considered unsuitable.

(2) Exception. A lease may be issued and mining operations approved if, after consultation with the Fish and Wildlife Service, the Service determines that the proposed activity is not likely to jeopardize the continued existence of the listed species and/or its critical habitat.

(3) Exemptions. This criterion does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(j)

(1) Criterion Number 10. Federal lands containing habitat determined to be critical or essential for plant or animal species listed by a state pursuant to state law as endangered or threatened shall be considered unsuitable.

(2) Exception. A lease may be issued and mining operations approved if, after consultation with the state, the surface management agency determines that the species will not be adversely affected by all or certain stipulated methods of coal mining.

(3) Exemptions. This criterion does not apply to lands: To which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(k)

(1) Criterion Number 11. A bald or golden eagle nest or site on Federal lands that is determined to be active and an appropriate buffer zone of land around the nest site shall be considered unsuitable. Consideration of availability of habitat for prey species and of terrain shall be included in the determination of buffer zones. Buffer zones shall be determined in consultation with the Fish and Wildlife Service.

(2) Exceptions. A lease may be issued if:

(i) It can be conditioned in such a way, either in manner or period of operation, that eagles will not be disturbed during breeding season; or

(ii) The surface management agency, with the concurrence of the Fish and Wildlife Service, determines that the golden eagle nest(s) will be moved.

(iii) Buffer zones may be decreased if the surface management agency determines that the active eagle nests will not be adversely affected.

(3) Exemptions. This criterion does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(l)

(1) Criterion Number 12. Bald and golden eagle roost and concentration areas on Federal lands used during migration and wintering shall be considered unsuitable.

(2) Exception. A lease may be issued if the surface management agency determines that all or certain stipulated methods of coal mining can be conducted in such a way, and during such periods of time, to ensure that eagles shall not be adversely disturbed.

(3) Exemptions. This criterion does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(m)

(1) Criterion Number 13. Federal lands containing a falcon (excluding kestrel) cliff nesting site with an active nest and a buffer zone of Federal land around the nest site shall be considered unsuitable. Consideration of availability of habitat for prey species and of terrain shall be included in the determination of buffer zones. Buffer zones shall be determined in consultation with the Fish and Wildlife Service.

(2) Exception. A lease may be issued where the surface management agency, after consultation with the Fish and Wildlife Service, determines that all or certain stipulated methods of coal mining will not adversely affect the falcon habitat during the periods when such habitat is used by the falcons.

(3) Exemptions. This criterion does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(n)

(1) Criterion Number 14. Federal lands which are high priority habitat for migratory bird species of high Federal interest on a regional or national basis, as determined jointly by the surface management agency and the Fish and Wildlife Service, shall be considered unsuitable.

(2) Exception. A lease may be issued where the surface management agency, after consultation with the Fish and Wildlife Service, determines that all or certain stipulated methods of coal mining will not adversely affect the migratory bird habitat during the periods when such habitat is used by the species.

(3) Exemption. This criterion does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(o)

(1) Criterion Number 15. Federal lands which the surface management agency and the state jointly agree are habitat for resident species of fish, wildlife and plants of high interest to the state and which are essential for maintaining these priority wildlife and plant species shall be considered unsuitable. Examples of such lands which serve a critical function for the species involved include:

(i) Active dancing and strutting grounds for sage grouse, sharp-tailed grouse, and prairie chicken;

(ii) Winter ranges crucial for deer, antelope, and elk;

(iii) Migration corridor for elk; and

(iv) Extremes of range for plant species; and

A lease may be issued if, after consultation with the state, the surface management agency determines that all or certain stipulated methods of coal mining will not have a significant long-term impact on the species being protected.

(2) Exemptions. This criterion does not apply to lands: To which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(p)

(1) Criterion Number 16. Federal lands in riverine, coastal and special floodplains (100-year recurrence interval) on which the surface management agency determines that mining could not be undertaken without substantial threat of loss of life or property shall be considered unsuitable for all or certain stipulated methods of coal mining.

(2) Exemptions. This criterion does not apply to lands: To which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(q)

(1) Criterion Number 17. Federal lands which have been committed by the surface management agency to use as municipal watersheds shall be considered unsuitable.

(2) Exception. A lease may be issued where the surface management agency in consultation with the municipality (incorporated entity) or the responsible governmental unit determines, as a result of studies, that all or certain stipulated methods of coal mining will not adversely affect the watershed to any significant degree.

(3) Exemptions. This criterion does not apply to lands: To which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(r)

(1) Criterion Number 18. Federal lands with National Resource Waters, as identified by states in their water quality management plans, and a buffer zone of Federal lands 1/4 mile from the outer edge of the far banks of the water, shall be unsuitable.

(2) Exception. The buffer zone may be eliminated or reduced in size where the surface management agency determines that it is not necessary to protect the National Resource Waters.

(3) Exemptions. This criterion does not apply to lands: To which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(s)

(1) Criterion Number 19. Federal lands identified by the surface management agency, in consultation with the state in which they are located, as alluvial valley floors according to the definition in § 3400.0-5(a) of this title, the standards in 30 CFR Part 822, the final alluvial valley floor guidelines of the Office of Surface Mining Reclamation and Enforcement when published, and approved state programs under the Surface Mining Control and Reclamation Act of 1977, where mining would interrupt, discontinue, or preclude farming, shall be considered unsuitable. Additionally, when mining Federal land outside an alluvial valley floor would materially damage the quantity or

quality of water in surface or underground water systems that would supply alluvial valley floors, the land shall be considered unsuitable.

(2) Exemptions. This criterion does not apply to surface coal mining operations which produced coal in commercial quantities in the year preceding August 3, 1977, or which had obtained a permit to conduct surface coal mining operations.

(t)

(1) Criterion Number 20. Federal lands in a state to which is applicable a criterion (i) proposed by the state or Indian tribe located in the planning area, and (ii) adopted by rulemaking by the Secretary, shall be considered unsuitable.

(2) Exceptions. A lease may be issued when:

(i) Such criterion is adopted by the Secretary less than 6 months prior to the publication of the draft comprehensive land use plan or land use analysis, plan, or supplement to a comprehensive land use plan, for the area in which such land is included, or

(ii) After consultation with the state or affected Indian tribe, the surface management agency determines that all or certain stipulated methods of coal mining will not adversely affect the value which the criterion would protect.

(3) Exemptions. This criterion does not apply to lands: To which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

From: Michael Saul
To: blm_mt_great_falls_lease_ea@blm.gov
Cc: [Michael Saul; aweber@biologicaldiversity.org](mailto:Michael.Saul@biologicaldiversity.org); elly.benson@sierraclub.org
Subject: Comments on October 2016 Oil and Gas Lease Sale
Date: Tuesday, June 14, 2016 8:45:35 AM
Attachments: [MT Hi-Line October 2016 lease sale comment.pdf](#)

Dear Ms. Wallace,

Please find attached, in .pdf format, the comments of the Center for Biological Diversity and the Montana Chapter of the Sierra Club on the HiLine District October 2016 oil and gas lease sale and accompanying Environmental Assessment. A CD containing the listed references has been sent separately via federal express.

Sincerely,

Michael Saul

Michael Saul
Senior Attorney, Public Lands
Center for Biological Diversity
phone/text (303) 915-8308

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June 14, 2016

Via Electronic Delivery

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Re: HiLine District Lease Auction: November 2016 Lease Parcels

Dear Ms. Wallace:

The Center for Biological Diversity and the Montana Chapter of the Sierra Club write to submit the following comments on the Environmental Assessment (“EA”) for the proposed October 2016 Competitive Oil and Gas Lease Sale. The Bureau of Land Management (“BLM”) Montana State Office is offering 87 parcels in northern Montana within the HiLine District.

We are deeply concerned that new fossil fuel leasing within the planning areas will contribute to worsening the climate crisis. To preserve any chance of averting catastrophic climate disruption, the vast majority of all *proven* fossil fuels must be kept in the ground. Opening up new areas to oil and gas exploration and unlocking new sources of greenhouse gas pollution would only fuel greater warming and contravenes BLM’s mandate to manage the public lands “without permanent impairment of the productivity of the land and the quality of the environment.”¹ BLM should end all new leasing in the planning areas and all other areas that it manages in order to limit the climate change effects of its actions; at a minimum, it should defer any such leasing until such time as it can conduct a comprehensive review of the climate consequences of its leasing activities, at the national and regional scale.

BLM should also ban new hydraulic fracturing (“fracking”) and other unconventional well stimulation activities in the planning areas. BLM must analyze the consequences of alternatives other than simply leasing and no action, including a no-fracking alternative. The lease sale EA and Environmental Impact Statements (“EIS”) for the HiLine Resource Management Plan (“RMP”) do not adequately analyze the relatively new and dangerous

¹ See 43 U.S.C. §§ 1701(a)(7), 1702(c), 1712(c)(1), 1732(a) (emphasis added); see also *id.* § 1732(b) (directing Secretary to take any action to “prevent unnecessary or undue degradation” of the public lands).

extraction methods of fracking and horizontal drilling, or the increased seismic risks from such extraction methods. Given the likelihood that fracking and other similarly harmful techniques would be employed in the exploration and development of the parcels, BLM must analyze and disclose the potential impacts resulting from such frequently used practices, including at the lease-parcel scale. BLM must fully analyze the public health, environmental justice, and industrialization impacts of unconventional fossil fuel extraction and especially hydraulic fracturing across the planning areas.

For the reasons set forth in this letter, we insist that BLM: (1) cease all new leasing of fossil fuels in the planning areas, including oil and natural gas; or, at a minimum (2) defer the proposed October 2016 sale pending a programmatic review of all federal fossil fuel leasing which must consider a “no leasing” and “no fracking” plan amendments. Should BLM proceed with the sale, BLM must: (1) initiate formal consultation with the Fish and Wildlife Service, as required by the Endangered Species Act (“ESA”); and (2) prepare a full EIS for the proposed lease sale in consideration of significant unexamined impacts from the consequences of leasing. Any such EIS must consider a full range of alternatives, including an alternative that bans new hydraulic fracturing and other unconventional well stimulation activities, and require strict controls on natural gas emissions and leakage.

I. BLM Must End All New Fossil Fuel Leasing and Hydraulic Fracturing.

Climate change is a problem of global proportions resulting from the cumulative greenhouse gas emissions of countless individual sources. A comprehensive look at the impacts of fossil fuel extraction, and especially fracking, across all of the planning areas affected by the leases in updated RMPs is absolutely necessary. BLM has *never* thoroughly considered the cumulative climate change impacts of *all* potential fossil fuel extraction and fracking (1) within each of the planning areas, (2) across the state, and (3) across all public lands. Proceeding with new leasing proposals *ad hoc* in the absence of a comprehensive plan that addresses climate change and fracking is premature and risks irreversible damage before the agency and public have had the opportunity to weigh the full costs of oil and gas and other fossil fuel extraction and consider necessary limits on such activities. Therefore BLM must cease all new leasing at least until the issue is adequately analyzed in a programmatic review of all U.S. fossil fuel leasing, or at least within amended RMPs.

A. BLM Must Limit Greenhouse Gas Emissions By Keeping Federal Fossil Fuels In the Ground

Expansion of fossil fuel production will substantially increase the volume of greenhouse gases emitted into the atmosphere and jeopardize the environment and the health and well being of future generations. BLM’s mandate to ensure “harmonious and coordinated management of the various resources *without permanent impairment of the productivity of the land and the quality of the environment*” requires BLM to limit the climate change effects of its actions.² Keeping all unleased fossil fuels in the ground and banning fracking and other unconventional

² See 43 U.S.C. §§ 1701(a)(7), 1702(c), 1712(c)(1), 1732(a) (emphasis added); *see also id.* § 1732(b) (directing Secretary to take any action to “prevent unnecessary or undue degradation” of the public lands).

well stimulation methods would lock away millions of tons of greenhouse gas pollution and limit the destructive effects of these practices.

A ban on new fossil fuel leasing and fracking is necessary to meet the U.S.'s greenhouse gas reduction commitments. On December 12, 2015, 197 nation-state and supra-national organization parties meeting in Paris at the 2015 United Nations Framework Convention on Climate Change Conference of the Parties consented to an agreement (Paris Agreement) committing its parties to take action so as to avoid dangerous climate change.³ As the United States signed the treaty on April 22, 2016⁴ as a legally binding instrument through executive agreement,⁵ the Paris Agreement commits the United States to critical goals—both binding and aspirational—that mandate bold action on the United States' domestic policy to rapidly reduce greenhouse gas emissions.⁶

The United States and other parties to the Paris Agreement recognized “the need for an effective and progressive response to the urgent threat of climate change on the basis of the best available scientific knowledge.”⁷ The Paris Agreement articulates the practical steps necessary to obtain its goals: parties including the United States have to “reach global peaking of greenhouse gas emissions *as soon as possible* . . . and to *undertake rapid reductions* thereafter in accordance *with best available science*,”⁸ imperatively commanding that developed countries specifically “should continue taking the lead by undertaking economy-wide absolute emission reduction targets”⁹ and that such actions reflect the “highest possible ambition.”¹⁰

The Paris Agreement codifies the international consensus that climate change is an “urgent threat” of global concern,¹¹ and commits all signatories to achieving a set of global goals. Importantly, the Paris Agreement commits all signatories to an articulated target to hold the long-term global average temperature “to *well below 2°C* above pre-industrial levels and to *pursue efforts to limit the temperature increase to 1.5°C* above pre-industrial levels”¹² (emphasis added).

In light of the severe threats posed by even limited global warming, the Paris Agreement established the international goal of limiting global warming to 1.5°C above pre-industrial levels

³ United Nations Framework Convention on Climate Change, Adoption of the Paris Agreement, Proposal by the President, Draft decision -/CP.21 (2015) (“Paris Agreement”)

⁴ For purposes of this Petition, the term “treaty” refers to its international law definition, whereby a treaty is “an international law agreement concluded between states in written form and governed by international law” pursuant to article 2(a) of the Vienna Convention on the Law of Treaties, 1155 U.N.T.S. 331, 8 I.L.M. 679 (Jan. 27, 1980).

⁵ See United Nations Treaty Collection, Chapter XXVII, 7.d Paris Agreement, List of Signatories; U.S. Department of State, Background Briefing on the Paris Climate Agreement, (Dec. 12, 2015), <http://www.state.gov/r/pa/prs/ps/2015/12/250592.htm>.

⁶ Although not every provision in the Paris Agreement is legally binding or enforceable, the U.S. and all parties are committed to perform the treaty commitments in good faith under the international legal principle of *pacta sunt servanda* (“agreements must be kept”). Vienna Convention on the Law of Treaties, Art. 26.

⁷ *Id.*, Recitals.

⁸ *Id.*, Art. 4(1).

⁹ *Id.*, Art. 4(4).

¹⁰ *Id.*, Art. 4(3).

¹¹ *Id.*, Recitals.

¹² *Id.*, Art. 2.

in order to “prevent dangerous anthropogenic interference with the climate system,” as set forth in the UNFCCC, a treaty which the United States has ratified and to which it is bound.¹³ The Paris consensus on a 1.5°C warming goal reflects the findings of the IPCC and numerous scientific studies that indicate that 2°C warming would exceed thresholds for severe, extremely dangerous, and potentially irreversible impacts.¹⁴ Those impacts include increased global food and water insecurity, the inundation of coastal regions and small island nations by sea level rise and increasing storm surge, complete loss of Arctic summer sea ice, irreversible melting of the Greenland ice sheet, increased extinction risk for at least 20-30% of species on Earth, dieback of the Amazon rainforest, and “rapid and terminal” declines of coral reefs worldwide.¹⁵ As scientists noted, the impacts associated with 2°C temperature rise have been “revised upwards, sufficiently so that 2°C now more appropriately represents the threshold between ‘dangerous’ and ‘extremely dangerous’ climate change.”¹⁶ Consequently, a target of 1.5 °C or less temperature rise is now seen as essential to avoid dangerous climate change and has largely supplanted the 2°C target that had been the focus of most climate literature until recently.

Immediate and aggressive greenhouse gas emissions reductions are necessary to keep warming below a 1.5° or 2°C rise above pre-industrial levels. Put simply, there is only a finite amount of CO₂ that can be released into the atmosphere without rendering the goal of meeting the 1.5°C target virtually impossible. A slightly larger amount could be burned before meeting a 2°C became an impossibility. Globally, fossil fuel reserves, if all were extracted and burned, would release enough CO₂ to exceed this limit several times over.¹⁷

The question of what amount of fossil fuels can be extracted and burned without negating a realistic chance of meeting a 1.5 or 2°C target is relatively easy to answer, even if the answer is framed in probabilities and ranges. The IPCC Fifth Assessment Report and other expert assessments have established global carbon budgets, or the total amount of remaining carbon that

¹³ See U.N. Framework Convention on Climate Change, Cancun Agreement. Available at <http://cancun.unfccc.int/> (last visited Jan 7, 2015); United Nations Framework Convention on Climate Change, Copenhagen Accord. Available at http://unfccc.int/meetings/copenhagen_dec_2009/items/5262.php (last accessed Jan 7, 2015). The United States Senate ratified the UNFCCC on October 7, 1992. See U.S. Congress, Ratification of Treaty Document titled The United Nations Framework Convention on Climate Change, adopted May 9, 1992, <https://www.congress.gov/treaty-document/102nd-congress/38>.

¹⁴ See Paris Agreement, Art. 2(1)(a); U; U.N. Framework Convention on Climate Change, Subsidiary Body for Scientific and Technical Advice, Report on the structured expert dialogue on the 2013-15 review, No. FCCC/SB/2015/INF.1 at 15-16 (June 2015); IPCC AR5 Synthesis Report at 65 & Box 2.4.

¹⁵ See Jones, C. et al, Committed Terrestrial Ecosystem Changes due to Climate Change, 2 Nature Geoscience 484, 484–487 (2009); Smith, J. B. *et al.*, Assessing Dangerous Climate Change Through an Update of the Intergovernmental Panel on Climate Change (IPCC) ‘Reasons for Concern’, 106 Proceedings of the National Academy of Sciences of the United States of America 4133, 4133–37 (2009); ; Veron, J. E. N. *et al.*, The Coral Reef Crisis: The Critical Importance of <350 ppm CO₂, 58 Marine Pollution Bulletin 1428, 1428–36, (2009); ; Warren, R. J. *et al.*, Increasing Impacts of Climate Change Upon Ecosystems with Increasing Global Mean Temperature Rise, 106 Climatic Change 141–77 (2011); Hare, W. W. *et al.*, Climate Hotspots: Key Vulnerable Regions, Climate Change and Limits to Warming, 11 Regional Environmental Change 1, 1–13 (2011); ; Frieler, K. M. *et al.*, Limiting Global Warming to 2°C is Unlikely to Save Most Coral Reefs, Nature Climate Change, Published Online (2013) doi: 10.1038/NCLIMATE1674; ; M. Schaeffer *et al.*, Adequacy and Feasibility of the 1.5°C Long-Term Global Limit, Climate Analytics (2013).

¹⁶ Anderson, K. and A. Bows, Beyond ‘Dangerous’ Climate Change: Emission Scenarios for a New World, 369 Philosophical Transactions, Series A, Mathematical, Physical, and Engineering Sciences 20, 20–44 (2011).

¹⁷ Cimons, Marlene, Keep it in the Ground, Sierra Club, 350.org, Greenpeace (2016)

can be burned while maintaining some probability of staying below a given temperature target. According to the IPCC, total cumulative anthropogenic emissions of CO₂ must remain below about 1,000 gigatonnes (GtCO₂) from 2011 onward for a 66% probability of limiting warming to 2°C above pre-industrial levels.¹⁸ Given more than 100 GtCO₂ have been emitted since 2011,¹⁹ the remaining portion of the budget under this scenario is well below 900 GtCO₂. To have an 80% probability of staying below the 2°C target, the budget from 2000 is 890 GtCO₂, with less than 430 GtCO₂ remaining.²⁰

To have even a 50% probability of achieving the Paris Agreement goal of limiting warming to 1.5°C above pre-industrial levels equates to a carbon budget of 550-600 GtCO₂ from 2011 onward,²¹ of which more than 100 GtCO₂ has already been emitted. To achieve a 66% probability of limiting warming to 1.5°C requires adherence to a more stringent carbon budget of only 400 GtCO₂ from 2011 onward,²² of which less than 300 GtCO₂ remained at the start of 2015. An 80% probability budget for 1.5°C would have far less than 300 GtCO₂ remaining. Given that global CO₂ emissions in 2014 alone totaled 36 GtCO₂,²³ humanity is rapidly consuming the remaining burnable carbon budget needed to have even a 50/50 chance of meeting the 1.5°C temperature goal.²⁴

According to a recent report by EcoShift Consulting commissioned by the Center and Friends of the Earth, unleased (and thus unburnable) federal fossil fuels represent a significant source of potential greenhouse gas emissions:

- Potential GHG emissions of federal fossil fuels (leased and unleased) if developed would release up to 492 gigatons (Gt) (one gigaton equals 1 billion tons) of carbon dioxide equivalent pollution (CO₂e); representing 46 percent to 50 percent of potential emissions from all remaining U.S. fossil fuels.

¹⁸ IPCC, 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change; Summary for Policymakers at 27; IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change at 64 & Table 2.2 [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)] at 63-64 & Table 2.2 (“IPCC AR5 Synthesis Report”).

¹⁹ From 2012-2014, 107 GtCO₂ was emitted (*see* Annual Global Carbon Emissions at <http://co2now.org/Current-CO2/CO2-Now/global-carbon-emissions.html>).

²⁰ Carbon Tracker Initiative, Unburnable Carbon – Are the world’s financial markets carrying a carbon bubble? available at <http://www.carbontracker.org/wp-content/uploads/2014/09/Unburnable-Carbon-Full-rev2-1.pdf>; Meinshausen, M. *et al.*, Greenhouse gas emission targets for limiting global warming to 2 degrees Celsius, 458 Nature 1158, 1159 (2009)

²¹ IPCC AR5 Synthesis Report at 64 & Table 2.2.

²² *Id.*

²³ *See* Global Carbon Emissions, <http://co2now.org/Current-CO2/CO2-Now/global-carbon-emissions.html>

²⁴ In addition to limits on the *amount* of fossil fuels that can be utilized, emissions pathways compatible with a 1.5 or 2°C target also have a significant temporal element. Leading studies make clear that to reach a reasonable likelihood of stopping warming at 1.5° or even 2°C, global CO₂ emissions must be phased out by mid-century and likely as early as 2040-2045. *See, e.g.* Joeri Rogelj *et al.*, Energy system transformations for limiting end-of-century warming to below 1.5°C, 5 Nature Climate Change 519, 522 (2015). United States focused studies indicate that we must phase out fossil fuel CO₂ emissions even earlier—between 2025 and 2040—for a reasonable chance of staying below 2°C. *See, e.g.* Climate Action Tracker, <http://climateactiontracker.org/countries/usa>. Issuing new legal entitlements to explore for and extract federal fossil fuels for decades to come is wholly incompatible with such a transition.

- Of that amount, up to 450 Gt CO₂e have not yet been leased to private industry for extraction;
- Releasing those 450 Gt CO₂e (the equivalent annual pollution of more than 118,000 coal-fired power plants) would be greater than any proposed U.S. share of global carbon limits that would keep emissions below scientifically advised levels.

Fracking has also opened up vast reserves that otherwise would not be available, increasing the potential greenhouse gas emissions that can be released into the atmosphere. BLM must consider a ban on this dangerous practice and a ban on new leasing to prevent the worst effects of climate change.

B. BLM Must Consider A Ban on New Oil and Gas Leasing and Fracking in a Programmatic Review and Halt All New Leasing and Fracking in the Meantime.

Development of unleased oil and gas resources will fuel climate disruption and undercut the needed transition to a clean energy economy. As BLM has not yet had a chance to consider no-leasing and no-fracking alternatives as part of any of its RMP planning processes or a comprehensive review of its federal oil and gas leasing program, BLM should suspend new leasing until it properly considers this alternative in updated RMPs or a programmatic EIS for the entire leasing program. BLM demonstrably has tools available to consider the climate consequences of its leasing programs, and alternatives available to mitigate those consequences, at either a regional or national scale.²⁵ Indeed, in its 2010 Supplementary Implementation Report, BLM inventoried greenhouse gas emissions from its Montana/Dakotas leasing activities and listed alternatives to mitigate emissions, but has never considered reasonable alternatives that would limit and/or condition leasing to mitigate greenhouse gas emissions.

BLM would be remiss to continue leasing when it has never stepped back and taken a hard look at this problem at the programmatic scale. Before allowing more oil and gas extraction in the planning area, BLM must: (1) comprehensively analyze the total greenhouse gas emissions which result from past, present, and potential future fossil fuel leasing and all other activities across all BLM lands and within the various planning areas at issue here, (2) consider their cumulative significance in the context of global climate change, carbon budgets, and other greenhouse gas pollution sources outside BLM lands and the planning area, and (3) formulate measures that avoid or limit their climate change effects. By continuing leasing and allowing new fracking in the absence of any overall plan addressing climate change BLM is effectively burying its head in the sand.

A programmatic review and moratorium on new leasing would be consistent with the Secretary of Interior's recent order to conduct a comprehensive, programmatic EIS (PEIS) on its coal leasing program, in light of the need to take into account the program's impacts on climate change, among other issues, and "the lack of any recent analysis of the Federal coal program as a

²⁵ See, e.g., BLM Montana, North Dakota and South Dakota, Climate Change Supplementary Information Report (updated Oct. 2010) (conducting GHG inventory for BLM leasing in Montana, North Dakota and South Dakota); BLM, Proposed Rule: Waste Prevention, Production Subject to Royalties, and Resource Conservation, 81 Fed. Reg. 6615 (Feb. 8, 2016) (proposing BLM-wide rule for prevention of methane waste).

whole.”²⁶ Specifically, the Secretary directed that the PEIS “should examine how best to assess the climate impacts of continued Federal coal production and combustion and how to address those impacts in the management of the program to meet both the Nation's energy needs and its climate goals, as well as how best to protect the public lands from climate change impacts.”²⁷

The Secretary also ordered a moratorium on new coal leasing while such a review is being conducted. The Secretary reasoned:

Lease sales and lease modifications result in lease terms of 20 years and for so long thereafter as coal is produced in commercial quantities. Continuing to conduct lease sales or approve lease modifications during this programmatic review risks locking in for decades the future development of large quantities of coal under current rates and terms that the PEIS may ultimately determine to be less than optimal. This risk is why, during the previous two programmatic reviews, the Department halted most lease sales with limited exceptions. . . . Considering these factors and given the extensive recoverable reserves of Federal coal currently under lease, I have decided that a similar policy is warranted here. A pause on leasing, with limited exceptions, will allow future leasing decisions to benefit from the recommendations that result from the PEIS while minimizing any economic hardship during that review.²⁸

The Secretary’s reasoning is also apt here. A programmatic review assessing the climate change effects of public fossil fuels is long overdue. And there is no shortage of oil and gas that would preclude a moratorium while such a review is conducted, as evidenced by very low natural oil and gas prices. More importantly, BLM should not “risk[] locking in for decades the future development of large quantities of [fossil fuels] under current. . . terms that a [programmatic review] may ultimately determine to be less than optimal.”²⁹ BLM should cancel the sale and halt all new leasing and fracking until a programmatic review is completed.

II. The Dangers of Hydraulic Fracking and Horizontal Drilling

New information, not adequately addressed in the HiLine RMPs, makes clear that the use of hydraulic fracturing within the area is both readily foreseeable and already occurring with significant environment environmental consequences. NEPA regulations and case law require that BLM evaluate all “reasonably foreseeable” direct and indirect effects of its leasing.³⁰

²⁶ See The Secretary of the Interior, Order No. 3338 re: Discretionary Programmatic Environmental Impact Statement to Modernize the Federal Coal Program, U.S. Department of the Interior, § 4 (Jan 15, 2016).

²⁷ *Id.* § 4(c).

²⁸ *Id.* § 5.

²⁹ *Id.*

³⁰ . 40 C.F.R. § 1508.8; *Davis v. Coleman*, 521 F.2d 661, 676 (9th Cir. 1975); *Center for Biological Diversity v. Bureau of Land Management* (“*CBD*”), 937 F. Supp. 2d 1140 (N.D. Cal. 2013) (holding that oil and gas leases were issued in violation of NEPA where BLM failed to prepare an EIS and unreasonably concluded that the leases would have no significant environmental impact because the agency failed to take into account all reasonably foreseeable development under the leases).

The proposed leasing action is part of a dramatic recent increase in oil and gas leasing in the areas at issue, and reflects increased industry interest in developing Montana’s fossil fuel resources. The entire basis for this surge of interest is the possibility that hydraulic fracturing and other advanced recovery techniques will allow the profitable exploitation of geologic formations previously perceived as insufficiently valuable for development. Elements of these technologies have been used individually for decades. However, the combination of practices employed by industry recently is new: “Modern formation stimulation practices have become more complex and the process has developed into a sophisticated, engineered process in which production companies strive to design a hydraulic fracturing treatment to emplace fracture networks in specific areas.”³¹

Hydraulic fracturing brings with it all of the harms to water quality, air quality, the climate, species, and communities associated with traditional oil and gas development, but also brings increased risks in many areas. Analysis of the consequences of this practice, prior to irrevocable consequences, is therefore required at the leasing stage. Oil and gas leasing is an irrevocable commitment to convey rights to use of federal land – a commitment with readily predictable environmental consequences that BLM is required to address. These include the specific geological formations, surface and ground water resources, seismic potential, or human, animal, and plant health and safety concerns present in the area to be leased.

Hydraulic fracturing, a dangerous practice in which operators inject toxic fluid underground under extreme pressure to release oil and gas, has greatly increased industry interest in developing tightly held oil and gas deposits such as those in the proposed lease area. The first aspect of this technique is the hydraulic fracturing of the rock. When the rock is fractured, the resulting cracks in the rock serve as passages through which gas and liquids can flow, increasing the permeability of the fractured area. To fracture the rock, the well operator injects hydraulic fracturing fluid at tremendous pressure. The composition of fracturing fluid has changed over time. Halliburton developed the practice of injecting fluids into wells under high pressure in the late 1940s;³² however, companies now use permutations of “slick-water” fracturing fluid developed in the mid-1990s.³³ The main ingredient in modern fracturing fluid (or “frack fluid”) is generally water, although liquefied petroleum has also been used as a base fluid for modern fracking.³⁴ The second ingredient is a “proppant,” typically sand, that becomes wedged in the fractures and holds them open so that passages remain after pressure is relieved.³⁵ In addition to the base fluid and proppant, a mixture of chemicals are used, for purposes such as increasing the

³¹ Arthur, J. Daniel et al., *Hydraulic Fracturing Considerations for Natural Gas Wells of the Marcellus Shale* at 2 (Sep. 2008) (“Arthur”) at 9.

³² Tompkins, *How will High-Volume (Slick-water) Hydraulic Fracturing of the Marcellus (or Utica) Shale Differ from Traditional Hydraulic Fracturing?* Marcellus Accountability Project at 1 (Feb. 2011).

³³ New York State Department of Environmental Conservation, *Final Supplemental Generic Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program, Well Permit Issuance for Horizontal Drilling and High-Volume Hydraulic Fracturing to Develop the Marcellus Shale and Other Low-Permeability Gas Reservoirs* (2015) (“NYDEC SGEIS”) at 5-5.

³⁴ *Id.*; Arthur at 10; Waxman, Henry et al., United States House of Representatives, Committee on Energy and Commerce, *Minority Staff, Chemicals Used in Hydraulic Fracturing* (Apr. 2011) (“Waxman 2011b”).

³⁵ Arthur at 10.

viscosity of the fluid, keeping proppants suspended, impeding bacterial growth or mineral deposition.³⁶

Frack fluid is hazardous to human health, although industry's resistance to disclosing the full list of ingredients formulation of frack fluid makes it difficult for the public to know exactly how dangerous.³⁷ A congressional report sampling incomplete industry self-reports found that "[t]he oil and gas service companies used hydraulic fracturing products containing 29 chemicals that are (1) known or possible human carcinogens, (2) regulated under the Safe Drinking Water Act for their risks to human health, or (3) listed as hazardous air pollutants under the Clean Air Act."³⁸ Recently published scientific papers also describe the harmfulness of the chemicals often in fracking fluid. One study reviewed a list of 944 fracking fluid products containing 632 chemicals, 353 of which could be identified with Chemical Abstract Service numbers.³⁹ The study concluded that more than 75 percent of the chemicals could affect the skin, eyes, and other sensory organs, and the respiratory and gastrointestinal systems; approximately 40 to 50 percent could affect the brain/nervous system, immune and cardiovascular systems, and the kidneys; 37 percent could affect the endocrine system; and 25 percent could cause cancer and mutations.⁴⁰

The impacts associated with the fracking-induced oil and gas development boom has caused some jurisdictions to place a moratorium or ban on fracking. For instance, in 2011 France became the first country to ban the practice.⁴¹ In May, Vermont became the first state to ban fracking. Vermont's governor called the ban "a big deal" and stated that the bill "will ensure that we do not inject chemicals into groundwater in a desperate pursuit for energy."⁴² New York State halted fracking within its borders in 2008, continued the moratorium in 2014 and banned the practice in 2015. The state's seven-year review concluded that fracking posed risks to land, water, natural resources and public health.^{43 44} Also, New Jersey's legislature recently passed a bill that would prevent fracking waste, like toxic wastewater and drill cuttings, from entering its borders,⁴⁵ and Pennsylvania, ground zero for the fracking debate, has banned "natural-gas exploration across a swath of suburban Philadelphia . . ."⁴⁶ Numerous cities and communities, like Buffalo, Pittsburgh, Raleigh, Woodstock, and Morgantown have banned fracking.⁴⁷

³⁶ Arthur at 10.

³⁷ Waxman 2011b; *see also* Colborn, Theo et al., *Natural Gas Operations for a Public Health Perspective*, 17 Human and Ecological Risk Assessment 1039 (2011) ("Colborn 2011"); McKenzie, Lisa et al., *Human Health Risk Assessment of Air Emissions from Development of Unconventional Natural Gas Resources*, *Sci Total Environ* (2012), doi:10.1016/j.scitotenv.2012.02.018 ("McKenzie 2012").

³⁸ Waxman 2011b at 8.

³⁹ Colborn 2011 at 1.

⁴⁰ Colborn 2011 at 1.

⁴¹ Castelvechi, Davide, *France becomes first country to ban extraction of natural gas by fracking*, *Scientific American* (Jun. 30, 2011).

⁴² CNN Staff Writer, *Vermont first state to ban fracking*, CNN U.S. (May 17, 2012).

⁴³ Public News Service - NY, *Cuomo Declares: No Fracking for Now in NY*. See:

<http://www.publicnewsservice.org/2014-12-18/health-issues/cuomo-declares-no-fracking-for-now-in-ny/a43579-1> .

⁴⁴ RT Network. June 30, 2015. *It's official: New York bans fracking*. <https://www.rt.com/usa/270562-new-york-fracking-ban/> .

⁴⁵ Tittel, Jeff, *Opinion: Stop fracking waste from entering New Jersey's borders* (Jul 14, 2012) available at http://www.nj.com/times-opinion/index.ssf/2012/07/opinion_stop_fracking_waste_fr.html .

⁴⁶ Philly.com, *Fracking ban is about our water*, *The Inquirer* (Jul. 11, 2012).

⁴⁷ CBS, *Pittsburgh Bans Natural Gas Drilling*, CBS/AP (Dec 8, 2010); Wooten, Michael *City of Buffalo Bans Fracking* (Feb. 9, 2011); *The Raleigh Telegram, Raleigh City Council Bans Fracking Within City Limits* (Jul. 11,

Separate from hydraulic fracturing, the second technological development underlying the recent shale boom is the use of horizontal drilling. Shale oil and shale gas formations are typically located far below the surface, and as such, the cost of drilling a vertical well to access the layer is high.⁴⁸ The shale formation itself is typically a thin layer; however, such that a vertical well only provides access to a small volume of shale—the cylinder of permeability surrounding the well bore.⁴⁹ Although hydraulic fracturing increases the radius of this cylinder of shale, this effect is often itself insufficient to allow profitable extraction of shale resources.⁵⁰ Horizontal drilling solves this economic problem: by drilling sideways along the shale formation once it is reached, a company can extract resources from a much higher volume of shale for the same amount of drilling through the overburden, drastically increasing the fraction of total well length that passes through producing zones.⁵¹ The practice of combining horizontal drilling with hydraulic fracturing was developed in the early 1990s.⁵²

A third technological development is the use of “multi-stage” fracking. In the 1990s industry began drilling longer and longer horizontal well segments. The difficulty of hydraulic fracturing increases with the length of the well bore to be fractured, however, both because longer well segments are more likely to pass through varied conditions in the rock and because it becomes difficult to create the high pressures required in a larger volume.⁵³ In 2002 industry began to address these problems by employing multi-stage fracking. In multi-stage fracking, the operator treats only part of the wellbore at a time, typically 300 to 500 feet.⁵⁴ Each stage “may require 300,000 to 600,000 gallons of water,” and consequently, a frack job that is two or more stages can contaminate and pump into the ground over a million gallons of water.⁵⁵

Notwithstanding the grave impacts that these practices have on the environment, this new combination of multi-stage slickwater hydraulic fracturing and horizontal drilling has made it possible to profitably extract oil and gas from formations that only a few years ago were generally viewed as uneconomical to develop.⁵⁶ The effect of hydraulic fracturing on the oil and gas markets has been tremendous, with many reports documenting the boom in domestic energy production. A recent congressional report notes that “[a]s a result of hydraulic fracturing and advances in horizontal drilling technology, natural gas production in 2010 reached the highest

2012); Kemble, William, *Woodstock bans activities tied to fracking*, Daily Freeman (Jul. 19, 2012); MetroNews.com, *Morgantown Bans Fracking* (June 22, 2011), available at <http://www.wvmetronews.com/news.cfm?func=displayfullstory&storyid=46214>.

⁴⁸ CITI, *Resurging North American Oil Production and the Death of the Peak Oil Hypothesis* at 9 (Feb. 15, 2012) (“CITI”); United States Energy Information Administration, *Review of Emerging Resources: U.S. Shale Gas and Shale Oil Plays* at 4 (Jul. 2011) (“USEIA 2011”); Orszag, Peter, *Fracking Boom Could Finally Cap Myth of Peak Oil* (Jan. 31, 2011) (“Orszag”).

⁴⁹ *Id.*

⁵⁰ *Id.*; Arthur at 8 (Figure 4).

⁵¹ Venoco, Inc., *Monterey Shale Focused Analyst Day Slide Show* at 23 (May 26, 2010) (“Venoco Slide Show”), USEIA 2012a at 63.

⁵² *Id.*

⁵³ NYDEC SGEIS at 5-93.

⁵⁴ *Id.*

⁵⁵ *Id.*

⁵⁶ See CITI at 9; U.S. Energy Information Administration, *Review of Emerging Resources: U.S. Shale Gas and Shale Oil Plays* at 4 (Jul. 2011); Orszag.

level in decades.”⁵⁷ A 2011 U.S. EIA report notes how recently these changes have occurred, stating that “only in the past 5 years has shale gas been recognized as a ‘game changer’ for the U.S. natural gas market.”⁵⁸ With respect to oil, the EIA notes that oil production has been increasing, with the production of shale oil resources pushing levels even higher over the next decade:

Domestic crude oil production has increased over the past few years, reversing a decline that began in 1986. U.S. crude oil production increased from 5.0 million barrels per day in 2008 to 5.5 million barrels per day in 2010. Over the next 10 years, continued development of tight oil, in combination with the ongoing development of offshore resources in the Gulf of Mexico, pushes domestic crude oil production higher.⁵⁹

Thus, it is evident that fracking, including fracking with the most recent techniques that have been associated with serious adverse impacts in other areas of the country, is poised to expand; it is further evident that the oil and gas industry is still exploring new locations to develop, and the nation has not yet seen the full extent of fracking’s impact on oil and gas development and production.

In large part through the use of fracking, the oil and gas sector is now producing huge amounts of oil and gas throughout the United States, rapidly transforming the domestic energy outlook. Fracking is occurring in the absence of any adequate federal or state oversight. The current informational and regulatory void on the state level makes it even more critical that the BLM perform its legal obligations to review, analyze, disclose, and avoid and mitigate the impacts of its oil and gas leasing decisions. Further, given the failure of the existing Green River, Rawlins, Kemmerer, and Pinedale RMPs to adequately address the impacts of fracking, it would be inappropriate for BLM to simply refer to the environmental analysis for these documents.

III. Unconventional Oil and Gas Operations Pose Risks to Water Resources

While much remains to be learned about fracking,⁶⁰ it is clear that the practice poses serious threats to water resources. Across the U.S., in states where fracking or other types of unconventional oil and gas recovery has occurred, surface water and groundwater have been contaminated. Recent studies have concluded that water contamination attributed to unconventional oil and gas activity has occurred in several states, including Colorado,⁶¹ Wyoming,⁶² Texas,⁶³ Pennsylvania,⁶⁴ Ohio,⁶⁵ and West Virginia.⁶⁶

⁵⁷ Waxman 2011b at 1.

⁵⁸ USEIA 2011 at 4.

⁵⁹ U.S. Energy Information Administration, Annual Energy Outlook 2012 with Projections to 2035 (2012) (“USEIA 2012a”) at 2

⁶⁰ United States Government Accountability Office, Unconventional Oil and Gas Development – Key Environmental and Public Health Requirements (2012); United States Government Accountability Office, Oil and Gas – Information on Shale Resources, Development, and Environmental and Public Health Risks (2012).

⁶¹ Trowbridge, A., *Colorado Floods Spur Fracking Concerns*, CBS News, Sept. 17, 2013, available at http://www.cbsnews.com/8301-201_162-57603336/colorado-floods-spur-fracking-concerns/ (“Trowbridge 2013”) (accessed July 30, 2015).

⁶² U.S. Environmental Protection Agency, Draft Investigation of Ground Water Contamination near Pavillion, Wyoming (2011) (“USEPA Draft Pavillion Investigation”); DiGiulio, Dominic C. et al. Impact to Underground Sources of Drinking Water and Domestic Wells from Production Well Stimulation and Completion Practices in the

The likelihood that the sale will result in fracking raises several issues that BLM must address:

- Where will the water come from and what are the impacts of extracting it?
- What chemicals will be used in the drilling and fracking process?
- How will BLM ensure the collection and disclosure of that information?
- What limitations will BLM place on the chemicals used in order to protect public health and the environment?
- What measures will BLM require to ensure adequate monitoring of water impacts, both during and after drilling?
- What baseline data is available to ensure that monitoring of impacts can be carried out effectively? How will BLM collect baseline data that is not currently available?
- Much of the fracking fluid return to the surface as toxic waste. Where will the discharge go?
- Is there the potential for subsurface migration of fracking fluids, or the potential for those fluids to escape into the groundwater by way of a faulty casing?
- What kinds of treatment will be required?
- What is the potential footprint and impact of the necessary treatment facilities?

BLM's analysis of potential impacts to water must take account of all significant and "foreseeable" impacts to water that may arise from the sale, including the following issues.

1. Surface Water Contamination

Surface waters can be contaminated in many ways from unconventional well stimulation. In addition to storm water runoff, surface water contamination may also occur from chemical and waste transport, chemical storage leaks, and breaches in pit liners.⁶⁷ The spilling or leaking of fracking fluids, flowback, or produced water is a serious problem. Harmful chemicals present

Pavillion, Wyoming, Field, Environ. Sci. Technol., 2016, 50 (8), pp. 4524–4536, abstract available at <http://pubs.acs.org/doi/abs/10.1021/acs.est.5b04970>.

⁶³ Fontenot, Brian et al., *An Evaluation of Water Quality in Private Drinking Water Wells Near Natural Gas Extraction Sites in the Barnett Shale Formation*, Environ. Sci. Technol., 47 (17), 10032–10040 DOI: 10.1021/es4011724, available at <http://pubs.acs.org/doi/abs/10.1021/es4011724> ("Fontenot 2013").

⁶⁴ Jackson, Robert et al., *Increased Stray Gas Abundance in a Subset of Drinking Water Wells near Marcellus Shale Gas Extraction*, Proc. Natl. Acad. of Sciences Early Edition, doi: 10.1073/pnas.1221635110/-/DCSupplemental (2013) ("Jackson 2013").

⁶⁵ Ohio Department of Natural Resources, Report on the Investigation of the Natural Gas Invasion of Aquifers in Bainbridge Township of Geauga County, Ohio (Sep. 2008) ("ODNR 2008").

⁶⁶ Begos, K., *Four States Confirm Water Pollution*, Associated Press, January 5, 2014, available at <http://www.usatoday.com/story/money/business/2014/01/05/some-states-confirm-water-pollution-from-drilling/4328859/> (accessed July 29, 2015); see also U.S. EPA, Assessment of the Potential Impacts of Hydraulic Fracturing for Oil and Gas on Drinking Water Resources, External Review Draft (June 2015) ("EPA 2015"), available at http://ofmpub.epa.gov/eims/eimscomm.getfile?p_download_id=523539 (accessed July 30, 2015).

⁶⁷ Vengosh, Avner et al., *A Critical Review of the Risks to Water Resources from Unconventional Shale Gas Development and Hydraulic Fracturing in the United States*, Environ. Sci. Technol., DOI: 10.1021/es405118y (2014) ("Vengosh 2014").

in these fluids can include volatile organic compounds (“VOCs”), such as benzene, toluene, xylenes, and acetone.⁶⁸ As much as 25 percent of fracking chemicals are carcinogens,⁶⁹ and flowback can even be radioactive.⁷⁰ As described below, contaminated surface water can result in many adverse effects to wildlife, agriculture, and human health and safety. It may make waters unsafe for drinking, fishing, swimming and other activities, and may be infeasible to restore the original water quality once surface water is contaminated. BLM should consider this analysis in the EIS.

i. Chemical and Waste Transport

Massive volumes of chemicals and wastewater used or produced in oil and gas operations have the potential to contaminate local watersheds. Between 2,600 to 18,000 gallons of chemicals are injected per hydraulically fracked well depending on the number of chemicals injected.⁷¹ This waste can reach fresh water aquifers and drinking water.

Produced waters that fracking operations force to the surface from deep underground can contain high levels of total dissolved solids, salts, metals, and naturally occurring radioactive materials.⁷² If spilled, the effects of produced water or brine can be more severe and longer-lasting than oil spills, because salts do not biodegrade or break down over time.⁷³ The only way to deal with them is to remove them.⁷⁴ The accumulation of long-lived isotopes of radium has been observed in the sediments and soils of produced-water spill sites.⁷⁵ Due to its relatively long half-life, radium contamination could remain in the soil for thousands of years.⁷⁶ Flowback waters (i.e., fracturing fluids that return to the surface) may also contain similar constituents along with fracturing fluid additives such as surfactants and hydrocarbons.⁷⁷ Given the massive volumes of chemicals and wastewater produced, their potentially harmful constituents, and their persistence in the environment, the potential for environmental disaster is real.

Fluids must be transported to and/or from the well, which presents opportunities for spills.⁷⁸ Unconventional well stimulation relies on numerous trucks to transport chemicals to the

⁶⁸ U.S. Environmental Protection Agency, Plan to Study the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources (Nov. 2011) (“EPA Plan to Study Fracking Impacts”).

⁶⁹ Colborn 2011.

⁷⁰ EPA Plan to Study Fracking Impacts; White, Ivan E., Consideration of radiation in hazardous waste produced from horizontal hydrofracking, National Council on Radiation Protection (2012).

⁷¹ EPA 2015 at ES-12.

⁷² Brittingham, Margaret C. et al., *Ecological Risks of Shale Oil and Gas Development to Wildlife, Aquatic Resources and their Habitats*, Environ. Sci. Technol. 2014, 48, 11034-11047, p. 11039; Lauer, Nancy E. Brine Spills Associated with Unconventional Oil Development in North Dakota. Environmental Science & Technology Article ASAP, DOI: 10.1021/acs.est.5b06349 (April 27, 2016), available at <http://pubs.acs.org/doi/abs/10.1021/acs.est.5b06349> (finding contaminants such as ammonium, selenium, and lead at produced-water spill sites in North Dakota, and contamination in violation of national water quality regulations).

⁷³ *Id.* at G (observing contamination from produced water “is remarkably persistent in the environment” and “elevated levels of salts and trace elements...can be preserved in spill sites for at least months to years”); King, Pamela, *Limited study supports findings on bigger brine spill risks*, E&E News (Nov. 4, 2015).

⁷⁴ *Id.*

⁷⁵ Lauer 2016 at G.

⁷⁶ *Id.*

⁷⁷ King 2015.

⁷⁸ Warco, Kathy, *Fracking truck runs off road; contents spill*, Observer Reporter (Oct 21, 2010).

site as well as collect and carry disposal fluid from the site to processing facilities. A U.S. Government Accountability Office (GAO) study found that up to 1,365 truck loads can be required just for the drilling and fracturing of a single well pad⁷⁹ while the New York Department of Conservation estimated the number of “heavy truck” trips to be about 3,950 per horizontal well (including unloaded and loaded trucks).⁸⁰ Accidents during transit may cause leaks and spills that result in the transported chemicals and fluids reaching surface waters. Chemicals and waste transported by pipeline can also leak or spill. There are also multiple reports of truckers dumping waste uncontained into the environment.⁸¹

The EIS should evaluate how often accidents can be expected to occur, and the effect of chemical and fluid spills. Such analysis should also include identification of the particular harms faced by communities near oil and gas fields. The EIS must include specific mitigation measures and alternatives based on a cumulative impacts assessment, and the particular vulnerabilities of environmental justice communities in both urban and rural settings.

ii. On-site Chemical Storage and Processing

Thousands of gallons of chemicals can be potentially stored on-site and used during hydraulic fracturing and other unconventional well stimulation activities.⁸² These chemicals can be susceptible to accidental spills and leaks. Natural occurrences such as storms and earthquakes may cause accidents, as can negligent operator practices.

Some sites may also use on-site wastewater treatment facilities. Improper use or maintenance of the processing equipment used for these facilities may result in discharges of contaminants. Other spill causes include equipment failure (most commonly, blowout preventer failure, corrosion and failed valves) and failure of container integrity.⁸³ Spills can result from accidents, negligence, or intentional dumping.

The EIS should examine and quantify the risks to human health and the environment associated with on-site chemical and wastewater storage, including risks from natural events and negligent operator practices. Again, such analysis must also include an analysis of potential impacts faced by environmental justice communities in both rural and urban settings.

2. Groundwater Contamination

Studies have reported many instances around the country of groundwater contamination due to surface spills of oil and gas wastewater, including fracking flowback.⁸⁴ Fracking and other

⁷⁹ U.S. Government Accountability Office, *Oil and Gas: Information on Shale Resources, Development, and Environmental and Public Health Risks*, GAO 12-732 (2012) at 33.

⁸⁰ New York Department of Environmental Conservation, *Final Supplemental Generic Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program*, Ch. 6 Potential Environmental Impacts (2015) at 6-306 –available at http://www.dec.ny.gov/docs/materials_minerals_pdf/fsgeis2015.pdf.

⁸¹ Kusnetz, Nicholas, *North Dakota’s Oil Boom Brings Damage Along with Prosperity* at 4, ProPublica (June 7, 2012) (“Kusnetz North Dakota”); E&E News, *Ohio man pleads not guilty to brine dumping* (Feb. 15, 2013).

⁸² EPA 2015 at ES-10.

⁸³ EPA 2015 at ES-11.

⁸⁴ *See, e.g.*, Fontenot 2013, Jackson 2013.

unconventional techniques likewise pose inherent risks to groundwater due to releases below the surface, and these risks must be properly evaluated.⁸⁵ Once groundwater is contaminated, it is very difficult, if not impossible, to restore the original quality of the water. As a result, in communities that rely on groundwater drinking water supplies, groundwater contamination can deprive communities of usable drinking water. Such long-term contamination necessitates the costly importation of drinking water supplies.

Groundwater contamination can occur in a number of ways, and the contamination may persist for many years.⁸⁶ Improper well construction and surface spills are cited as a confirmed or potential cause of groundwater contamination in numerous incidents at locations across the U.S. including but not limited to Colorado,⁸⁷ Wyoming,⁸⁸ Pennsylvania,⁸⁹ Ohio,⁹⁰ West Virginia,⁹¹ and Texas.⁹² These sorts of problems at the well are not uncommon. Dr. Ingraffea of Cornell has noted an 8.9 percent failure rate for wells in the Marcellus Shale.⁹³ Older wells that may not have been designed to withstand the stresses of hydraulic fracturing but which are reused for this purpose are especially vulnerable.⁹⁴

Current federal rules do not ensure well integrity. The EIS should study the rates of well casing failures over time and evaluate the likelihood that well casing failures can lead to groundwater contamination.

Also, fluids and hydrocarbons may contaminate groundwater by migrating through newly created or natural fractures.⁹⁵ Many unconventional techniques intentionally fracture the formation to increase the flow of gas or oil. New cracks and fissures can allow the additives or naturally occurring elements such as natural gas to migrate to groundwater. “[T]he increased

⁸⁵ Vengosh 2014.

⁸⁶ Myers, Tom, Potential Contamination Pathways from Hydraulically Fractured Shale to Aquifers, National Groundwater Association (2012).

⁸⁷ Gross, Sherilyn A. et al., *Abstract: Analysis of BTEX groundwater concentrations from surface spills associated with hydraulic fracturing operations*, 63 J. Air and Waste Mgmt. Assoc. 4, 424 doi: 10.1080/10962247.2012.759166 (2013).

⁸⁸ U.S. Environmental Protection Agency, Draft Investigation of Ground Water Contamination Near Pavillion, Wyoming (2011) (“EPA Draft Pavillion Investigation”).

⁸⁹ Darrah, Thomas H. et al., *Noble Gases Identify the Mechanisms of Fugitive Gas Contamination in Drinking-Water Wells Overlying the Marcellus and Barnett Shales*, Proc. Natl. Acad. Of Sciences Early Edition, doi: 10.1073/pnas.1322107111 (2014) (“Darrah 2014”).

⁹⁰ Begos, Kevin, *Some States Confirm Water Pollution from Oil, Gas Drilling*, Seattle Times, Jan. 6, 2014, <http://www.seattletimes.com/business/some-states-confirm-water-pollution-from-oil-gas-drilling/> (accessed July 29, 2015) (“Begos, Seattle Times, Jan 6, 2014”). See also, ODNR 2008, *supra*.

⁹¹ Begos, Seattle Times, Jan 6. 2014.

⁹² Darrah 2014.

⁹³ Ingraffea, Anthony R., Some Scientific Failings within High Volume Hydraulic Fracturing Proposed Regulations 6 NYCRR Parts 550-556, 560, Comments and Recommendations Submitted to the NYS Dept. of Environmental Conservation (Jan 8, 2013); see also Davies, Richard J. et al. Oil and gas wells and their integrity: Implications for shale and unconventional resource exploitation, *Marine and Petroleum Geology* 56 (2014) 239e254, available at http://ac.els-cdn.com/S0264817214000609/1-s2.0-S0264817214000609-main.pdf?_tid=7344676e-d5f1-11e5-9200-00000aab0f02&acdnat=1455767050_bdf90f64ecdb607187778614024039c4 (documenting 6.3% of wells in the Marcellus shale experienced well barrier or integrity failure between 2005 and 2013).

⁹⁴ EPA 2015 at 6-11.

⁹⁵ EPA Draft Pavillion Investigation; Warner, Nathaniel R., et al., *Geochemical Evidence for Possible Natural Migration of Marcellus Formation Brine to Shallow Aquifers in Pennsylvania*, PNAS Early Edition (2012).

deployment of hydraulic fracturing associated with oil and gas production activities, including techniques such as horizontal drilling and multi-well pads, may increase the likelihood that these pathways could develop,” which, “in turn, could lead to increased opportunities for impacts on drinking water sources.”⁹⁶ Fluids can also migrate through pre-existing and natural faults and fractures that may become pathways once the fracking or other method has been used.

A well in which stimulation operations are being conducted may also “communicate” with nearby wells, which may lead to groundwater and surface contamination, particularly if the nearby wells are improperly constructed or abandoned.⁹⁷ In the last 150 years, as many as 12 million “holes” have been drilled across the United States in search of oil and gas, many of which are old and decaying, or are in unknown locations.⁹⁸ Fracking can contaminate water resources by intersecting one of those wells. For instance, one study found at least nineteen instances of fluid communication in British Columbia and Western Alberta.⁹⁹ Wells as far away as 1.8 miles away have provided pathways for surface contamination.¹⁰⁰ The EIS must consider long-term studies on the potential for fluid migration through newly created subsurface pathways

According to the EPA, “evidence of any fracturing-related fluid migration affecting a drinking water resources...could take years to discover.”¹⁰¹ Another study based on modeling found that advective transport of fracking fluid from a fracked well to an aquifer could occur in less than 10 years.¹⁰²

Contamination of groundwater of drinking water sources is a real risk The EPA’s Draft Investigation of Groundwater Contamination near Pavillion, Wyoming, found that chemicals found in samples of groundwater were from fracked wells.¹⁰³ These results have been confirmed with follow-up analyses.¹⁰⁴ Groundwater contamination in the Barnett Shale region is likely a result of unconventional well development activities.¹⁰⁵ One study detected “multiple volatile organic carbon compounds throughout the region, including various alcohols, the BTEX family

⁹⁶ EPA 2015 at 6-55.

⁹⁷ See Detrow, Scott. (2012) *Perilous Pathways: How Drilling Near An Abandoned Well Produced a Methane Geyser*, StateImpact Pennsylvania, National Public Radio (October 9, 2012), available at <https://stateimpact.npr.org/pennsylvania/2012/10/09/perilous-pathways-how-drilling-near-an-abandoned-well-produced-a-methane-geyser/> (accessed July 29, 2015); Alberta Energy Board, Directive 083: Hydraulic Fracturing – Subsurface Integrity, Alberta Energy Regulator (2013), available at <http://www.aer.ca/documents/directives/Directive083.pdf>.

⁹⁸ Kusnetz, Nicholas, *Deteriorating Oil and Gas Wells Threaten Drinking Water, Homes Across the Country*, ProPublica (April 4, 2011).

⁹⁹ BC Oil & Gas Commission, Safety Advisory 2010-03, Communication During Fracture Stimulation (2010).

¹⁰⁰ King, Pamela, ‘Frack hits’ provide pathways for methane migration study, E&E News (Oct. 21, 2015).

¹⁰¹ EPA 2015 at 6-56 – 6-57.

¹⁰² Myers, Tom, Potential Contaminant Pathways from Hydraulically Fractured Shale to Aquifers, Ground Water 50, no. 6, p. 1 (2012).

¹⁰³ EPA Draft Pavillion Investigation.

¹⁰⁴ Drajem, Mark, *Wyoming Water Tests in Line with EPA Finding on Fracking*, Bloomberg (Oct. 11, 2012); U.S. Environmental Protection Agency, Investigation of Ground Water Contamination near Pavillion, Wyoming Phase V Sampling Event - Summary of Methods and Results (September 2012); Myers, Tom, Review of DRAFT: Investigation of Ground Water Contamination near Pavillion Wyoming Prepared by the Environmental Protection Agency, Ada OK (Apr. 30, 2012).

¹⁰⁵ Hildenbrand, Zacariah, A Comprehensive Analysis of Groundwater Quality in The Barnett Shale Region, Environ. Sci. Technol. (June 16, 2015), available at <http://pubs.acs.org/doi/abs/10.1021/acs.est.5b01526>.

of compounds, and several chlorinated compounds” in private and public drinking water well samples drawn from aquifers overlying the Barnett shale formation.”¹⁰⁶ Another study found that “arsenic, selenium, strontium and total dissolved solids (TDS) exceeded the Environmental Protection Agency’s Drinking Water Maximum Contaminant Limit (MCL) in some samples from private water wells located within 3 km of active natural gas wells.¹⁰⁷ Many of the detected compounds were associated with unconventional oil and gas extraction.¹⁰⁸

Fracking fluid can also spill at the surface during the fracking process. For instance, mechanical failure or operator error during the process has caused leaks from tanks, valves, and pipes.¹⁰⁹ At the surface, pits or tanks can leak fracking fluid or waste.¹¹⁰ Surface pits, in which wastewater is often dumped, are a major source of pollution. In California, a farmer was awarded \$8.5 million in damages after his almond trees died when he irrigated them with well water that had been contaminated by nearby oil and gas operations. The contamination was traced to unlined pits where one of California’s largest oil and gas producers for decades dumped billions of gallons of wastewater that slowly leached pollutants into nearby groundwater.¹¹¹

Unfiltered drinking water supplies, such as drinking water wells, are especially at risk because they have no readily available means of removing contaminants from the water. Even water wells with filtration systems are not designed to handle the kind of contaminants that result from unconventional oil and gas extraction.¹¹² In some areas hydraulic fracturing may occur at shallower depths or within the same formation as drinking water resources, resulting in direct aquifer contamination.¹¹³ The EIS must disclose where the potential for such drilling exists.

Setbacks may not be adequate to protect groundwater from potential fracking fluid contamination. A recent study by the University of Colorado at Boulder suggests that setbacks of even up to 300-feet may not prevent contamination of drinking water resources.¹¹⁴ The study found that 15 organic compounds found in hydraulic fracturing fluids may be of concern as

¹⁰⁶ *Id.*

¹⁰⁷ Fontenot, Brian et al., An Evaluation of Water Quality in Private Drinking Water Wells Near Natural Gas Extraction Sites in the Barnett Shale Formation, *Environ. Sci. Technol.*, 47 (17), 10032–10040 DOI: 10.1021/es4011724, available at <http://pubs.acs.org/doi/abs/10.1021/es4011724> (“Fontenot 2013”).

¹⁰⁸ *Id.*

¹⁰⁹ Natural Resources Defense Council, *Water Facts: Hydraulic Fracturing Can Potentially Contaminate Drinking Water Sources* (2012) at 2; Food and Water Watch, *The Case for a Ban on gas Fracking* (June 2011).at 7.

¹¹⁰ *See, e.g.*, E&E Staff Writer, *Fracking Fluid leaks from wellhead in Colo.*, *E&E News* (Feb 14, 2013). (“At least 84,000 gallons of water contaminated from hydraulic fracturing seeped from a broken wellhead and into a field”); Michaels, Craig, et al., *Fractured Communities: Case Studies of the Environmental Impacts of Industrial Gas Drilling*, *Riverkeeper* (2010) at 12.

¹¹¹ Renee Sharp & Bill Allayud, *California Regulator: See No Fracking, Speak No Fracking* at 6 (2012); *see also* Miller, Jeremy, *Oil and Water Don’t Mix with California Agriculture*, *High Country News* (2012).

¹¹² Physicians, Scientist & Engineers for Healthy Energy, Letter from Robert Howarth Ph.D. and 58 other scientists to Andrew M. Cuomo, Governor of New York State re: municipal drinking water filtration systems and hydraulic fracturing fluid (Sept 15, 2011), available at http://www.psehealthyenergy.org/data/Cuomo_ScientistsLetter_15Sep20112.pdf (accessed July 29, 2015).

¹¹³ EPA 2015 at ES-15.

¹¹⁴ University of Colorado--Boulder, *New study identifies organic compounds of potential concern in fracking Fluids* (July 1, 2015), available at <http://www.colorado.edu/news/releases/2015/06/30/newstudyidentifiesorganiccompoundspotentialconcernfrackingfluids> (accessed July 29, 2015).

groundwater contaminants based on their toxicity, mobility, persistence in the environment, and frequency of use. These chemicals could have 10 percent or more of their initial concentrations remaining at a transport distance of 300 feet, the average “setback” distance in the U.S. The effectiveness and feasibility of any proposed setbacks must be evaluated.

3. Disposal of Drilling and Fracking Wastes

Finally, disposal of wastes from oil and gas operations can also lead to contamination of water resources. Potential sources of contamination include:

- leaching from landfills that receive drilling and fracking solid wastes;
- spreading of drilling and fracking wastes over large areas of land;
- wastewaters discharged from treatment facilities without advanced “total dissolved solids” removal processes, or inadequate capacity to remove radioactive material removal; and
- breaches in underground injection disposal wells.¹¹⁵

U.S. EPA has found that California’s Class II underground injection well program to be insufficiently protective of groundwater resources.¹¹⁶

The EIS must evaluate the potential for contamination from each of these disposal methods.

A. More Intensive Oil and Gas Development Will Increase Storm Water Runoff

Oil and gas operations require land clearance for access roads, pipelines, well pads, drilling equipment, chemical storage, and waste disposal pits. As a result, new oil and gas development will cause short-term disturbance as well as long-term disturbance within the areas for lease. While undisturbed land can retain greater amounts of water through plants and pervious soil, land that has been disturbed or developed may be unable to retain as much water, thereby increasing the volume of runoff. The area of land that is able to retain water will be significantly decreased if unconventional oil and gas extraction methods are permitted to expand.

Water from precipitation and snowmelt can serve as an avenue through which contaminants travel from an operation site to sensitive areas, including population centers. Contaminated water runoff may seep into residential areas, polluting streets, sidewalks, soil, and vegetation in urban areas, adversely affecting human health. Thus, not only do these oil and gas activities create pollution, they create greater conduits for storm water runoff to carry those pollutants from the operation site, into areas in which significant harm can be caused.

¹¹⁵ EPA 2015, 8-20, 8-36, 8-48, 8-65, 8-70; USGS, Indication of Unconventional Oil and Gas Wastewaters Found in Local Surface Waters, available at http://toxics.usgs.gov/highlights/2016-05-09-uog_wastes_in_streams.html.

¹¹⁶ Walker, James, California Class II UIC Program Review, Report submitted to Ground Water Office USEPA Region 9 at 119 (Jun. 2011); U.S. Environmental Protection Agency Region IX, Letter from David Albright, Manager Ground Water, to Elena Miller, State Oil and Gas Supervisor Dept of Conservation re California Class II Underground Injection Control (UIC) Program Review final report (July 18, 2011).

Rapid runoff, even without contaminants, can harm the environment by changing water flow patterns and causing erosion, habitat loss, and flooding. Greater runoff volumes may also increase the amount of sediment that is carried to lakes and streams, affecting the turbidity and chemical content of surface waters. Because a National Pollutant Discharge Elimination System permit is not required for oil and gas operations,¹¹⁷ it is particularly important that the impact of runoff is considered as part of the NEPA process.

B. Fossil Fuel Development Depletes Enormous Amounts of Water

Some unconventional extraction techniques, most notably fracking, require the use of tremendous amounts of freshwater. Typically between 2 and 5.6 million gallons of water are required to frack each well.¹¹⁸ These volumes far exceed the amounts used in conventional natural gas development.¹¹⁹

Water used in large quantities may lead to several kinds of harmful environmental impacts. The extraction of water for fracking can, for example, lower the water table, affect biodiversity, harm local ecosystems, and reduce water available to communities.¹²⁰

Withdrawal of large quantities of freshwater from streams and other surface waters will undoubtedly have an impact on the environment.¹²¹ Withdrawing water from streams will decrease the supply for downstream users, such as farmers or municipalities. Rising demand from oil and gas operators has already led to increased competition for water between farmers and oil and gas operators. In some regions of Colorado, farmers have had to fallow fields due to astronomical water prices.¹²² For example, in prior years, farmers in Colorado have paid at most \$100 per acre-feet of water in auctions held by cities with excess supplies, but in 2013 energy companies paid \$1200 to \$2,900 per acre-feet.¹²³ Reductions in stream flows may also lead to downstream water quality problems by diminishing the water bodies' capacity for dilution and degradation.

Furthermore, withdrawing large quantities of water from subsurface waters to supply oil and gas production will likely deplete and harm aquifers. Removing water from surface water or directly from underground sources of water faster than the rate that aquifers can be replenished will lower the volume of water available for other uses. Depletion can also lead to compaction of the rock formation serving as an aquifer, after which the original level of water volume can never

¹¹⁷ 33 U.S.C. § 1342(l)(2).

¹¹⁸ U.S. Government Accountability Office 2012 at 17.

¹¹⁹ See Clark, Corrie E. et al., *Life Cycle Water Consumption for Shale Gas and Conventional Natural Gas*, Environ. Sci. Technol., 2013, 47 (20), pp 11829–11836, abstract available at <http://pubs.acs.org/doi/abs/10.1021/es4013855>.

¹²⁰ International Energy Agency, Golden Rules for the Golden Age of Gas at 31-32 (2012).

¹²¹ See Entrekin, Sally et al., *Rapid Expansion of Natural Gas Development Poses a Threat to Surface Waters*, 9 Front Ecol. Environ. 9, 503 (2011); EPA 2015 at 4-16.

¹²² Healy, Jack. For Farmers in the West, Oil Wells are Thirsty Rivals, The New York Times (Sept. 5, 2012), available at http://www.nytimes.com/2012/09/06/us/struggle-for-water-in-colorado-with-rise-in-fracking.html?_r=0 (accessed July 29, 2015); Burke, Garance. Fracking fuels water fights in nation's dry spots, Associated Press (June 17, 2013), available at <http://news.yahoo.com/fracking-fuels-water-fights-nations-dry-spots-133742770.html>.

¹²³ *Id.*

be restored.¹²⁴ Depleted aquifer water resources may also adversely affect agriculture, species habitat and ecosystems, and human health.

The freshwater in the planning areas therefore would be greatly affected by the increased demand for water if fracking and other unconventional oil and gas extraction are permitted. A no-fracking alternative would preserve scarce water resources and keep critical sources of drinking water in the planning area safe and clean. The EIS must analyze where water will be sourced, how much, and the effects on water sources under different alternatives. All of these effects must be analyzed in the context of increasing water scarcity in Montana due to climate change, drought, and increasing population growth.

C. Oil and Gas Developments Harm Aquatic Life and Habitat

When streams and other surface waters are depleted, the habitat for countless plants and animals will be harmed, and the depletion places tremendous pressure on species that depend on having a constant and ample stream of water. Oil and gas activities in the HiLine planning area, for example, may harm the listed pallid sturgeon and sensitive Northern Redbelly Dace, due to an increased risk of toxic spills and massive water depletions required for hydraulic fracturing and horizontal drilling.

A pair of studies that compared water quality downstream from a wastewater injection site in West Virginia to that of upstream areas found (1) downstream sites had elevated levels of endocrine-disrupting chemicals at levels known to adversely affect aquatic organisms; and (2) microbial communities in downstream sediments had lower diversity and shifts in community composition, altering microbial activity and potentially impacting nutrient cycling.¹²⁵

Physical habitats such as banks, pools, runs, and glides (low gradient river sections) are important yet susceptible to disturbance with changing stream flows. Altering the volume of water can also change the water's temperature and oxygen content, harming some species that require a certain level of oxygenated water. Decreasing the volume of streamflow and stream channels by diverting water to fracking would have a negative impact on the environment.

The physical equipment itself that is designed to intake and divert water may also pose a threat to certain wildlife. If not properly designed, such equipment and intake points may be a risk to wildlife.

D. Harm to Wetlands

¹²⁴ Freyman, Monika and Ryan Salmon, Hydraulic Fracturing and Water Stress: Growing Competitive Pressures for Water, CERES, 9 (2013) ("Freyman 2013"), available at <http://www.ceres.org/resources/reports/hydraulic-fracturing-water-stress-water-demand-by-the-numbers>.

¹²⁵ Akob, D.M., et al., 2016, Wastewater disposal from unconventional oil and gas development degrades stream quality at a West Virginia injection facility: Environmental Science and Technology, doi:10.1021/acs.est.6b00428 (Advanced Web release); Kassotis, C.D., et al., 2016, Endocrine disrupting activities of surface water associated with a West Virginia oil and gas Industry wastewater disposal site: Science of the Total Environment, v. 557–558, p. 901910, doi:10.1016/j.scitotenv.2016.03.113. The two studies are summarized at: http://toxics.usgs.gov/highlights/2016-05-09-uog_wastes_in_streams.html.

Oil and gas development, and particularly the practice of fracking, pose an immense threat to water resources. High volume removal of surface or groundwater can result in damage to wetlands, which rely on ample water supplies to maintain the fragile dynamics of a wetland habitat. Damage can also occur from spills of chemicals or wastewater, filling operations, and sediment runoff.¹²⁶ BLM in its environmental document must fully vet the impacts from every potential aspect of the proposed sale.

Many plant and animal species depend on wetland habitats, and even small changes can lead to significant impacts. Wetlands provide a variety of “eco-service” functions, including water purification, protection from floods, and functioning as carbon sinks.¹²⁷ The ecological importance of wetlands is unquestionable, and their full protection is paramount. The EIS must analyze these potential impacts to wetlands, and the related, potential indirect impacts that may stem from such impacts.

IV. Oil and Gas Operations Harm Air Quality

Oil and gas operations emit numerous air pollutants, including volatile organic compounds (VOCs), NO_x, particulate matter, hydrogen sulfide, and methane. Fracking operations are particularly harmful, emitting especially large amounts of pollution, including air toxic air pollutants. Permitting fracking and other well stimulation techniques will greatly increase the release of harmful air emissions in these and other regions. BLM should disallow new leasing, or else adopt a no-fracking alternative, which would prevent further degradation of local air quality, respiratory illnesses, premature deaths, hospital visits, as well as missed school and work days.

A. Types of Air Emissions

Unconventional oil and gas operations emit large amounts of toxic air pollutants,¹²⁸ also referred to as Hazardous Air Pollutants, which are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects.¹²⁹ The reporting requirements recently implemented by the California South Coast Air Quality Management District (“SCAQMD”) have shown that at least 44 chemicals known to be air toxics have been used in fracking and other types of unconventional oil and gas recovery in California.¹³⁰ Through the implementation of these new reporting requirements, it is now known that operators have been using several types of air toxics in California, including crystalline

¹²⁶ U.S. Department of Justice, *Trans Energy Inc. to Restore Streams and Wetland Damaged by Natural Gas Extraction Activities in West Virginia* (Sep. 2, 2014), <http://www.justice.gov/opa/pr/trans-energy-inc-restore-streams-and-wetland-damaged-natural-gas-extraction-activities-west> (accessed July 29, 2015); *See also*, Pennsylvania Department of Environmental Protection, Commonwealth of Pennsylvania, DEP Fines Seneca Resources Corp. \$40,000 for Violations at Marcellus Operation in Tioga County (Jul. 10, 2010), <http://www.portal.state.pa.us/portal/server.pt/community/newsroom/14287?id=14655&typeid=1> (accessed July 29, 2015).

¹²⁷ U.S. Environmental Protection Agency, Wetlands and People, <http://water.epa.gov/type/wetlands/people.cfm> (accessed July 29, 2015).

¹²⁸ Sierra Club et al. comments on New Source Performance Standards: Oil and Natural Gas Sector; Review and Proposed Rule for Subpart OOOO (Nov. 30, 2011) (“Sierra Club Comments”) at 13.

¹²⁹ U.S. EPA, Hazardous Air Pollutants, available at <http://www.epa.gov/haps> (accessed Jan. 10, 2016).

¹³⁰ Center for Biological Diversity, Air Toxics One Year Report, p. 1 (June 2014).

silica, methanol, hydrochloric acid, hydrofluoric acid, 2-butoxyethanol, ethyl glycol monobutyl ether, xylene, amorphous silica fume, aluminum oxide, acrylic polymer, acetophenone, and ethylbenzene. Many of these chemicals also appear on the U.S. EPA's list of hazardous air pollutants.¹³¹ EPA has also identified six "criteria" air pollutants that must be regulated under the National Ambient Air Quality Standards (NAAQS) due to their potential to cause primary and secondary health effects. Concentrations of these pollutants—ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide and lead—will likely increase in regions where unconventional oil and gas recovery techniques are permitted.

VOCs, from car and truck engines as well as the drilling and completion stages of oil and gas production, make up about 3.5 percent of the gases emitted by oil or gas operations.¹³² The VOCs emitted include the BTEX compounds – benzene, toluene, ethyl benzene, and xylene – which are listed as Hazardous Air Pollutants.¹³³ There is substantial evidence showing the grave harm from these pollutants.¹³⁴ Recent studies and reports confirm the pervasive and extensive amount of VOCs emitted by unconventional oil and gas extraction.¹³⁵ In particular, a study covering sites near oil and gas wells in five different states found that concentrations of eight volatile chemicals, including benzene, formaldehyde and hydrogen sulfide, exceeded risk-based comparison values under several operational circumstances.¹³⁶ Another study determined that vehicle traffic and engine exhaust were likely the sources of intermittently high dust and benzene concentrations observed near well pads.¹³⁷ Recent studies have found that oil and gas operations are likely responsible for elevated levels of hydrocarbons such as benzene downwind of the Denver-Julesburg Fossil Fuel Basin, north of Denver.¹³⁸ Another study found that oil and gas operations in this area emit approximately 55% of the VOCs in northeastern Colorado.¹³⁹

VOCs can form ground-level (tropospheric) ozone when combined with nitrogen oxides ("NO_x"), from compressor engines, turbines, other engines used in drilling, and flaring,¹⁴⁰ and

¹³¹ U.S. Environmental Protection Agency, The Clean Air Act Amendments of 1990 List of Hazardous Air Pollutants, Technology Transfer Network Air Toxics Web Site, <http://www.epa.gov/ttnatw01/orig189.html> (accessed July 29, 2015).

¹³² Brown, Heather, Memorandum to Bruce Moore, U.S.EPA/OAQPS/SPPD re Composition of Natural Gas for use in the Oil and Natural Gas Sector Rulemaking, July 28, 2011 ("Brown Memo") at 3.

¹³³ 42 U.S.C. § 7412(b).

¹³⁴ Colborn 2011; McKenzie 2012; Food & Water Watch 2012.

¹³⁵ McCawley, M., Air, Noise, and Light Monitoring Plan for Assessing Environmental Impacts of Horizontal Gas Well Drilling Operations (ETD-10 Project), West Virginia University School of Public Health, Morgantown, WV (2013) ("McCawley 2013"), available at <http://www.dep.wv.gov/oil-and-gas/Horizontal-Permits/legislativestudies/Documents/WVU%20Final%20Air%20Noise%20Light%20Protocol.pdf>; Center for Biological Diversity, Dirty Dozen: The 12 Most Commonly Used Air Toxics in Unconventional Oil Development in the Los Angeles Basin (Sept. 2013).

¹³⁶ Macey, G.P. et al., Air Concentrations of Volatile Compounds Near Oil and Gas Production: A Community-Based Exploratory Study, 13 Environmental Health 82 (2014) at 1.

¹³⁷ McCawley 2013.

¹³⁸ Pétron, G. et al., Hydrocarbon Emissions Characterization in the Colorado Front Range – A Pilot Study, 117 J. Geophysical research D04304 (2012), at 8, 13 ("Pétron 2012").

¹³⁹ Gilman, J.B. et al., *Source Signature of Volatile Organic Compounds from Oil and Natural Gas Operations in Northeastern Colorado*, 47 Env'tl. Sci & Tech. 1297, 1303 (2013).

¹⁴⁰ See, e.g., U.S. Environmental Protection Agency, Oil and Gas Sector: Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution: Background Technical Support Document for Proposed Standards at 3-6 (July 2011); Armendariz, Al, Emissions for Natural Gas Production in the Barnett Shale Area and Opportunities for Cost-Effective Improvements (2009) ("Armendariz") at 24.

sunlight. This reaction can diminish visibility and air quality and harm vegetation. Tropospheric ozone can also be caused by methane, which is leaked and vented at various stages of unconventional oil and gas development, as it interacts with nitrogen oxides and sunlight.¹⁴¹ In addition to its role as a greenhouse gas, methane contributes to increased concentrations of ground-level ozone, the primary component of smog, because it is an ozone precursor.¹⁴² Methane's effect on ozone concentrations can be substantial. One paper modeled reductions in various anthropogenic ozone precursor emissions and found that "[r]educing anthropogenic CH₄ emissions by 50% nearly halves the incidence of U.S. high-O₃ events"¹⁴³

Like methane, VOCs and NO_x are also ozone precursors; therefore, many regions around the country with substantial oil and gas operations are now suffering from extreme ozone levels due to heavy emissions of these pollutants.¹⁴⁴ Ozone can result in serious health conditions, including heart and lung disease and mortality.¹⁴⁵ A recent study of ozone pollution in the Uintah Basin of northeastern Utah, a rural area that experiences hazardous tropospheric ozone concentrations, found that oil and gas operations were responsible for 98 to 99 percent of VOCs and 57 to 61 percent of NO_x emitted from sources within the Basin considered in the study's inventory.¹⁴⁶

Oil and gas operations can also emit hydrogen sulfide. The hydrogen sulfide is contained in the natural gas and makes that gas "sour."¹⁴⁷ Hydrogen sulfide may be emitted during all stages of operation, including exploration, extraction, treatment and storage, transportation, and refining. Long-term exposure to hydrogen sulfide is linked to respiratory infections, eye, nose, and throat irritation, breathlessness, nausea, dizziness, confusion, and headaches.¹⁴⁸

The oil and gas industry is also a major source of particulate matter. The heavy equipment regularly used in the industry burns diesel fuel, generating fine particulate matter¹⁴⁹ that is especially harmful.¹⁵⁰ Vehicles traveling on unpaved roads also kick up fugitive dust,

¹⁴¹ Fiore, Arlene et al., *Linking Ozone Pollution and Climate Change: The Case for Controlling Methane*, 29 *Geophys. Res Letters* 19 (2002).

¹⁴² U.S. Environmental Protection Agency, *Oil and Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews Proposed Rule*, 76 Fed. Reg 52,738 (Aug 23, 2011).

¹⁴³ Fiore, Arlene et al., *Linking ozone pollution and climate change: The case for controlling methane*, 29 *Geophys. Res Letters* 19 (2002); *see also* Martin, Randal et al., *Final Report: Uinta Basin Winter Ozone and Air Quality Study Dec 2010 - March 2011* (2011) at 7.

¹⁴⁴ Armendariz at 1, 3, 25-26; Wendy Koch, *Wyoming's Smog Exceeds Los Angeles' Due to Gas Drilling*, USA Today (May 9, 2011); Craft, Elena, *Environmental Defense Fund, Do Shale Gas Activities Play a Role in Rising Ozone Levels?* (2012); Colorado Dept. of Public Health and Environment, *Conservation Commission, Colorado Weekly and Monthly Oil and Gas Statistics* (July 6, 2012) at 12.

¹⁴⁵ U.S. Environmental Protection Agency, *Integrated Science Assessment (ISA) for Ozone (O₃) and Related Photochemical Oxidants* (2013).

¹⁴⁶ Lyman, Seth and Howard Shorthill, *Final Report: 2012 Uintah Basin Winter Ozone & Air Quality Study*, Utah Department of Environmental Quality (2013); *see also* Gilman, Jessica et al., *Source signature of volatile organic compounds from oil and natural gas operations in northeastern Colorado*, *Environ Sci and Technology* (Jan 14, 2013), DOI: 10.1021/es304119a.

¹⁴⁷ Sierra Club Comments.

¹⁴⁸ USEPA, Office of Air Quality Planning and Standards, *Report to Congress on Hydrogen Sulfide Air Emissions Associated with the Extraction of Oil and Natural Gas (EPA-453/R-93-045)* at i (Oct. 1993) ("USEPA 1993").

¹⁴⁹ Earthworks, *Sources of Oil and Gas Pollution* (2011).

¹⁵⁰ Bay Area Air Quality Management District, *Particulate Matter Overview, Particulate Matter and Human Health*

which is particulate matter.¹⁵¹ Further, both NO_x and VOCs, which as discussed above are heavily emitted by the oil and gas industry, are also particulate matter precursors.¹⁵² Some of the health effects associated with particulate matter exposure are “premature mortality, increased hospital admissions and development of chronic respiratory disease.”¹⁵³

Fracking results in additional air pollution that can create a severe threat to human health. One analysis found that 37 percent of the chemicals found at fracked gas wells were volatile, and that of those volatile chemicals, 81 percent can harm the brain and nervous system, 71 percent can harm the cardiovascular system and blood, and 66 percent can harm the kidneys.¹⁵⁴ Also, the SCAQMD has identified three areas of dangerous and unregulated air emissions from fracking: (1) the mixing of the fracking chemicals; (2) the use of the silica, or sand, as a proppant, which causes the deadly disease silicosis; and (3) the storage of fracking fluid once it comes back to the surface.¹⁵⁵ Preparation of the fluids used for well completion often involves onsite mixing of gravel or proppants with fluid, a process which potentially results in major amounts of particulate matter emissions.¹⁵⁶ Further, these proppants often include silica sand, which increases the risk of lung disease and silicosis when inhaled.¹⁵⁷ Finally, as flowback returns to the surface and is deposited in pits or tanks that are open to the atmosphere, there is the potential for organic compounds and toxic air pollutants to be emitted, which are harmful to human health as described above.¹⁵⁸

The EIS should study the potential for oil and gas operations sites in the planning area to emit such air toxics and any other pollutants that may pose a risk to human health, paying particular attention to the impacts of air pollution on environmental justice communities that already bear the burden of disproportionately high levels of air pollution. The EIS should rely on the most up-to-date information regarding the contribution of oil and gas operations to VOC and air toxics levels.

B. Sources of Air Emissions

Harmful air pollutants are emitted during every stage of unconventional oil and gas recovery, including drilling, completion, well stimulation, production, and disposal. Drilling and casing the wellbore require substantial power from large equipment. The engines used typically run on diesel fuel, which emits particularly harmful types of air pollutants when burned.

(2012).

¹⁵¹ U.S. Environmental Protection Agency, Regulatory Impact Analysis for the Proposed Revisions to the National Ambient Air Quality Standards for Particulate Matter (June 2012), http://www.epa.gov/ttnecas1/regdata/RIAs/PMRIACombinedFile_Bookmarked.pdf at 2-2, (“EPA RIA”).

¹⁵² EPA RIA at 2-2.

¹⁵³ U.S. Environmental Protection Agency, National Ambient Air Quality Standards for Particulate Matter Proposed Rule, 77 Fed. Reg. 38,890, 38,893 (June 29, 2012).

¹⁵⁴ Colborn 2011 at 8.

¹⁵⁵ South Coast Air Quality Management District, Draft Staff Report on Proposed Rule 1148.2 - Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers (January 2013).at 15 (“SCAQMD Revised Draft Staff Report PR1148-2”).

¹⁵⁶ *Id.*

¹⁵⁷ South Coast Air Quality Management District, Response to Questions re Air Quality Risks of Hydraulic Fracturing in California, Submission to Joint Senate Hearing (2013) at 3.

¹⁵⁸ SCAQMD Revised Draft Staff Report PR1148-2 at 15.

Similarly, high-powered pump engines are used in the fracturing and completion phase. This too can result in large volumes of air pollution. Flaring, venting, and fugitive emissions of gas are also a potential source of air emissions. Gas flaring and venting can occur in both oil and gas recovery processes when underground gas rises to the surface and is not captured as part of production. Fugitive emissions can occur at every stage of extraction and production, often leading to high volumes of gas being released into the air. Methane emissions from oil and gas production is as much as 270 percent greater than previously estimated by calculation.¹⁵⁹ Recent studies show that emissions from pneumatic valves (which control routine operations at the well pad by venting methane during normal operation) and fugitive emissions are higher than EPA estimates.¹⁶⁰

Evaporation from pits can also contribute to air pollution. Pits that store drilling waste, produced water, and other waste fluid may be exposed to the open air. Chemicals mixed with the wastewater—including the additives used to make fracking fluids, as well as volatile hydrocarbons, such as benzene and toluene, brought to the surface with the waste—can escape into the air through evaporation. Some pits are equipped with pumps that spray effluents into the air to hasten the evaporation process. Even where waste fluid is stored in so-called “closed loop” storage tanks, fugitive emissions can escape from tanks.

As mentioned above, increased truck traffic will lead to more air emissions. Trucks capable of transporting large volumes of chemicals and waste fluid typically use large engines that run on diesel fuel. Air pollutants from truck engines will be emitted not only at the well site, but also along truck routes to and from the site.

C. Impact of Increased Air Pollution

The potential harms resulting from increased exposure to the dangerous air pollutants described above are serious and wide ranging. The negative effects of criteria pollutants are well documented and are summarized by the U.S. EPA’s website:

Nitrogen oxides (NO_x) react with ammonia, moisture, and other compounds to form small particles. These small particles penetrate deeply into sensitive parts of the lungs and can cause or worsen respiratory disease, such as emphysema and bronchitis, and can aggravate existing heart disease, leading to increased hospital admissions and premature death. NO_x and volatile organic compounds react in the presence of heat and sunlight to form ozone.

Particulate matter (PM) – especially fine particles – contains microscopic solids or liquid droplets that are so small that they can get deep into the lungs and cause serious health problems. Numerous scientific studies have linked particle pollution exposure to a variety of problems, including: premature death in people with heart or lung disease, increased

¹⁵⁹ Miller, S. M. et al. Anthropogenic Emissions of Methane in the United States, Proc. Natl. Acad. Sci. Early Edition, DOI: 10.1073/pnas.1314392110 (2013) (“Miller 2013”).

¹⁶⁰ Allen, David et al., Measurements of methane emissions at natural gas production sites in the United States, PNAS Early Edition, doi:10.1073/pnas.1304880110 (2013). (“Allen 2013”); Harriss, Robert et al., Using Multi-Scale Measurements to Improve Methane Emission Estimates from Oil and Gas Operations in the Barnett Shale Region, Texas, Environ. Sci. Technol., 2015, 49 (13), pp 7524–7526.

mortality, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing.¹⁶¹

Sulfur Dioxide (SO₂) has been shown to cause an array of adverse respiratory effects including bronchoconstriction and increased asthma symptoms.¹⁶² Studies also show a connection between short-term exposure and increased visits to emergency departments and hospital admissions for respiratory illnesses, particularly in at-risk populations including children, the elderly, and asthmatics.¹⁶³

Carbon Monoxide (CO) can cause harmful health effects by reducing oxygen delivery to the body's organs (like the heart and brain) and tissues. At extremely high levels, CO can cause death.¹⁶⁴ Exposure to CO can reduce the oxygen-carrying capacity of the blood. People with several types of heart disease already have a reduced capacity for pumping oxygenated blood to the heart, which can cause them to experience myocardial ischemia (reduced oxygen to the heart), often accompanied by chest pain (angina), when exercising or under increased stress.¹⁶⁵ For these people, short-term CO exposure further affects their body's already compromised ability to respond to the increased oxygen demands of exercise or exertion.¹⁶⁶

Ozone (O₃) can trigger or worsen asthma and other respiratory ailments.¹⁶⁷ Ground level ozone can have harmful effects on sensitive vegetation and ecosystems. Ozone may also lead to loss of species diversity and changes to habitat quality, water cycles, and nutrient cycles.

Air toxics and hazardous air pollutants, by definition, can result in harm to human health and safety. The full extent of the health effects of exposure is still far from being complete, but already there are numerous studies that have found these chemicals to have serious health consequences for humans exposed to even minimal amounts. The range of illnesses that can result are summarized in a study by Dr. Theo Colburn, which charts which chemicals have been shown to be linked to certain illnesses.¹⁶⁸

Natural gas drilling operations result in the emissions of numerous non-methane hydrocarbons (NMHCs) that have been linked to numerous adverse health effects. A recent study

¹⁶¹ U.S. Environmental Protection Agency, Particulate Matter, (PM) <http://www.epa.gov/airquality/particulatepollution/health.html> (accessed July 30, 2015); Ostro, Bart et al., Long-term Exposure to Constituents of Fine Particulate Air Pollution and Mortality: Results from the California Teachers Study, 118 *Environmental Health Perspectives* 3 (2010).

¹⁶² U.S. Environmental Protection Agency, Sulfur Dioxide <http://www.epa.gov/airquality/sulfurdioxide/health.html>, available at (accessed July 29, 2015).

¹⁶³ *Id.*

¹⁶⁴ U.S. Environmental Protection Agency, Carbon Monoxide, available at <http://www.epa.gov/airquality/carbonmonoxide/health.html> (accessed July 29, 2015).

¹⁶⁵ *Id.*

¹⁶⁶ *Id.*

¹⁶⁷ U.S. Environmental Protection Agency, Ground Level Ozone, available at <http://www.epa.gov/airquality/ozonepollution/health.html> (accessed July 29, 2015).

¹⁶⁸ Colborn, Theo et al., Natural Gas Operations from a Public Health Perspective, 17 *Human and Ecological Risk Assessment* 1039 (2011) ("Colborn 2011"); Colborn, Theo, et al., An Exploratory Study of Air Quality near Natural Gas Operations, *Human and Ecological Risk Assessment: An International Journal* doi:10.1080/10807039.2012.749447 (2012); see note 120 & accompanying text below.

that analyzed air samples taken during drilling operations near natural gas wells and residential areas in Garfield County, detected 57 chemicals between July 2010 and October 2011, including 44 with reported health effects.¹⁶⁹ For example:

Thirty-five chemicals were found to affect the brain/nervous system, 33 the liver/metabolism, and 30 the endocrine system, which includes reproductive and developmental effects. The categories with the next highest numbers of effects were the immune system (28), cardiovascular/blood (27), and the sensory and respiratory systems (25 each). Eight chemicals had health effects in all 12 categories. There were also several chemicals for which no health effect data could be found.¹⁷⁰

The study found extremely high levels of methylene chloride, which may be used as cleaning solvents to remove waxy paraffin that is commonly deposited by raw natural gas in the region. These deposits solidify at ambient temperatures and build up on equipment.¹⁷¹ While none of the detected chemicals exceeded governmental safety thresholds of exposure, the study noted that such thresholds are typically based on “exposure of a grown man encountering relatively high concentrations of a chemical over a brief time period, for example, during occupational exposure.”¹⁷² Consequently, such thresholds may not apply to individuals experiencing “chronic, sporadic, low-level exposure,” including sensitive populations such as children, the elderly, and pregnant women.¹⁷³ For example, the study detected polycyclic aromatic hydrocarbon (PAH) levels that could be of “clinical significance,” as recent studies have linked low levels of exposure to lower mental development in children who were prenatally exposed.¹⁷⁴ In addition, government safety standards do not take into account “the kinds of effects found from low-level exposure to endocrine disrupting chemicals..., which can be particularly harmful during prenatal development and childhood.”¹⁷⁵

Another study reviewed exposures to emissions from unconventional natural gas development and noted that trimethylbenzenes are among the largest contributors to non-cancer threats for people living within a half mile of a well, while benzene is the largest contributor to cumulative cancer risk for people, regardless of the distance from the wells.¹⁷⁶

D. Air Modeling

BLM should use air modeling to understand what areas and communities will most likely be affected by air pollution. It is crucial to gather independent data rather than relying on

¹⁶⁹ Colborn et al., An Exploratory Study of Air Quality Near Natural Gas Operations, Human and Ecological Risk Assessment: An International Journal, Vol. 20, Iss. 1, 2014, pp. 21-22 (pages refer to page numbers in attached manuscript and not journal pages) (“Colborn 2014”), available at <http://www.tandfonline.com/doi/full/10.1080/10807039.2012.749447>.

¹⁷⁰ Colborn 2014, p. 11.

¹⁷¹ *Id.*, p. 10.

¹⁷² *Id.*, pp. 11-12.

¹⁷³ *Id.* p. 12.

¹⁷⁴ *Id.*, p. 10-11.

¹⁷⁵ *Id.*, p. 12.

industry estimates, which may be inaccurate or biased. Wind and weather patterns, and atmospheric chemistry, determine the fate and transport of air pollution over a region, over time. The EIS should be informed by air modeling to show where the air pollution will flow.

V. Fossil Fuel Development Will Exacerbate Climate Change

A. BLM Must Fully Analyze Greenhouse Gas Emissions of Oil and Gas Operations.

BLM cannot ignore the mounting evidence proving that oil and gas operations are a major cause of climate change. This is due to emissions from the operations themselves, and emissions from the combustion of the oil and gas produced. Every step of the lifecycle process for development of these resources results in significant carbon emissions, including but not limited to:

End-user oil and gas combustion emissions. The combustion of extracted oil and gas will add vast amounts of carbon dioxide to the atmosphere, further heating the climate and moving the Earth closer to catastrophic and irreversible climate change. Though much of the oil is used as gasoline to fuel the transportation sector, the produced oil may also be used in other types of products. The EIS should study all end-uses as contributors to climate change.

Combustion in the distribution of product. To the extent that distribution of raw and end-use products will rely on rail or trucks, the combustion of gasoline or diesel to transport these products will emit significant greenhouse gas emissions.

Emissions from Refineries and Production. Oil and gas must undergo intensive refinery and production processes before the product is ready for consumption. Refineries and their auxiliary activities constitute a significant source of emissions.

Vented emissions. Oil and gas wells may vent gas that flows to the surface at times where the gas cannot otherwise be captured and sold. Vented gas is a significant source of greenhouse gas emissions and can also pose a safety hazard.

Combustion during construction and extraction operations. Operators rely on both mobile and stationary sources of power to construct and run their sites. The engines of drilling or excavation equipment, pumps, trucks, conveyors, and other types of equipment burn large amounts of fuel to operate. Carbon dioxide, methane, and nitrous oxide (another potent greenhouse gas) are emitted from oxidized fuel during the combustion process. Engines emit greenhouse gases during all stages of oil and gas recovery, including drilling rig mobilization, site preparation and demobilization, completion rig mobilization and demobilization, well drilling, well completion (including fracking and other unconventional extraction techniques), and well production. Transportation of equipment and chemicals to and from the site is an integral part of the production process and contributes to greenhouse gas emissions. Gas flaring is another important source of carbon dioxide emissions. Significant sources of emissions in oil production include pneumatic devices, dehydrators and pumps, and compressors, and system upsets.¹⁷⁷

¹⁷⁷ U.S. Environmental Protection Agency, National Gas STAR Program, Basic Information, Major Methane Emission Sources and Opportunities to Reduce Methane Emissions (“USEPA, Basic Information”).

Fugitive emissions. Potent greenhouse gases can leak as fugitive emissions at many different points in the production process, especially in the production of gas wells. Recent studies suggest that previous estimates significantly underestimate leakage rates.¹⁷⁸ New research shows methane leakage from some gas wells may be as high at 17.3 percent.¹⁷⁹ Moreover, new research has shown that unconventional gas wells are up to 2.7 times more likely than a conventional well to have a cement or casing impairment, which can lead to methane leaks.¹⁸⁰ The intersection of new fractures with nearby abandoned wells can also result in methane migration to the surface.¹⁸¹ Leakage can also occur during storage, processing, and distribution to customers.¹⁸²

Natural gas emissions are generally about 84 percent methane.¹⁸³ Methane is a potent greenhouse gas that contributes substantially to global climate change. Its global warming potential is approximately 34 times that of carbon dioxide over a 100 year time frame and at least 86 times that of carbon dioxide over a 20 year time frame.¹⁸⁴ Oil and gas operations release large amounts of methane. While the exact amount is not clear, EPA has estimated that “oil and gas systems are the largest human-made source of methane emissions and account for 37 percent of methane emissions in the United States and is expected to be one of the most rapidly growing sources of anthropogenic methane emissions in the coming decades.”¹⁸⁵ That proportion is based on an estimated calculation of methane emissions, rather than measured actual emissions, which indicate that methane emissions may be much greater in volume than calculated.¹⁸⁶

¹⁷⁸ Brandt, A. R. *et al.*, *Methane leaks from North American natural gas systems*, 343 *Science* 733 (2014); Miller, S. M. *et al.* Anthropogenic Emissions of Methane in the United States, *Proc. Natl. Acad. Sci. Early Edition*, DOI: 10.1073/pnas.1314392110 (2013) (“Miller 2013”).

¹⁷⁹ Caulton, Dana R. *et al.*, *Toward a Better Understanding and Quantification of Methane Emissions from Shale Gas Development*, 111 *Proc. Natl. Acad. Sciences* 17 (2014); Schneising, Oliver, *et al.*, Remote Sensing of Fugitive Methane Emissions from Oil and Gas Production in North American Tight Geologic Formations, *Earth’s Future* 2, doi:10.1002/2014EF000265 (2014); Allen, D. T. *et al.*, (2013), *Measurements of Methane Emissions at Natural Gas Production Sites in the United States*, 110 *Proc. Natl. Acad. Sci.* 44 (2013) (“Allen 2013”); Zavala-Araizaa, Daniel *et al.*, *Reconciling divergent estimates of oil and gas methane emissions*, 112 *Proc. Natl. Acad. Sciences* 51 (2015), available at www.pnas.org/cgi/doi/10.1073/pnas.1522126112 (leakage rate 1.5% of production in Barnett shale or twice EPA’s estimate); Vaidyanathan, G, Bad news for the climate as methane leaks far surpass previous estimates, *E&E News* (Dec. 8, 2015) (leakage rate in Barnett shale equal to annual emissions of 8,000 cars).

¹⁸⁰ Ingraffea, Anthony R, *et al.*, *Assessment and Risk Analysis of Casing and Cement Impairment in Oil and Gas Wells in Pennsylvania, 2000 – 2012*, 111 *Proc. Natl. Acad. Sciences* 30 (2014).

¹⁸¹ King, Pamela. *‘Frack hits’ provide pathways for methane migration study*, *E&E News* (Oct. 21, 2015).

¹⁸² Howarth, R. W. A bridge to nowhere: methane emissions and the greenhouse gas footprint of natural gas, *Energy Science and Engineering* 2014; 2(2): 47–60, 49 (“Howarth 2014”).

¹⁸³ Brown Memo to EPA at 3; Power, Thomas, *The Local Impacts of Natural Gas Development in Valle Vidal, New Mexico*, University of Montana (2005) (“Power”).

¹⁸⁴ Intergovernmental Panel on Climate Change, Chapter 8: Anthropogenic and Natural Radiative Forcing in Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Table 8.7 (2013); Howarth, Robert, *et al.*, Methane and the greenhouse-gas footprint of natural gas from shale formations, *Climatic Change* (Mar. 31, 2011) (“Howarth 2011”); Shindell, Drew, *Improved Attribution of Climate Forcing to Emissions*, 326 *Science* 716 (2009).

¹⁸⁵ USEPA, Basic Information; *see also* Petron, Gabrielle, *et al.*, *Hydrocarbon emissions characterization in the Colorado Front Range: A pilot study*, 117 *Journal of Geophysical Research* (2012).

¹⁸⁶ Miller, S. M. *et al.*, *Anthropogenic Emissions of Methane in the United States*, *Proc. Natl. Acad. Sci. Early Edition*, DOI: 10.1073/pnas.1314392110 (2013).

Fracked wells leak an especially large amount of methane, with some evidence indicating that the leakage rate is so high that shale gas is worse for the climate than coal.¹⁸⁷ In fact, a research team associated with the National Oceanic and Atmospheric Administration recently reported that preliminary results from a field study in the Uinta Basin of Utah suggest that the field leaked methane at an eye-popping rate of nine percent of total production.¹⁸⁸

The EIS must weigh the no-leasing and no-fracking alternatives' climate-change benefits against the impacts of allowing new leasing and fracking, and address the following:

1. *Sources of Greenhouse Gases*

In performing a full analysis of climate impacts, BLM must consider all potential sources of greenhouse gas emissions (e.g. greenhouse gas emissions generated by transporting large amounts of water for fracking). BLM should also perform a full analysis of all gas emissions that contribute to climate change, including methane and carbon dioxide. The EIS should calculate the amount of greenhouse gas that will result on an annual basis from (1) each of the fossil fuels that can be developed within the planning area, (2) each of the well stimulation or other extraction methods that can be used, including, but not limited to, fracking, acidization, acid fracking, and gravel packing, and (3) cumulative greenhouse gas emissions expected over the long term (expressed in global warming potential of each greenhouse pollutant as well as CO₂ equivalent), including emissions throughout the entire fossil fuel lifecycle discussed above.

2. *Effects of Climate Change*

In addition to quantifying the total emissions that would result from the lease sale, an EIS should consider the environmental effects of these emissions, resulting from climate disruption's ecological and social effects.¹⁸⁹ Release of greenhouse gases (from extraction, leakage, and downstream combustion) is not merely a reasonably foreseeable consequence of fracking extraction, it is the necessary and intended consequence. CEQ and the courts have repeatedly cautioned federal agencies that they cannot ignore either climate change generally, or the combustion impacts of fossil fuel extraction in particular.¹⁹⁰

On December 12, 2015, nearly 200 governments, including the United States, agreed to

¹⁸⁷ Howarth 2011; Brune, Michael, Statement of Sierra Club Executive Director Michael Brune Before the Committee on Oversight & Government Reform (May 31, 2012); Wang, Jinsheng, et al., Reducing the Greenhouse Gas Footprint of Shale (2011); Alvarez, Ramon et al., *Greater focus needed on methane leakage from natural gas infrastructure*, Proc. Nat'l. Acad. Sci. Early Edition (Feb 13, 2012) at 3; *see also* Howarth, Robert, et al., Venting and Leaking of Methane from Shale Gas Development: Response to Cathles et al., (2012); Hou, Deyi, et al., Shale gas can be a double-edged sword for climate change, *Nature Climate Change* at 386 (2012)

¹⁸⁸ Tollefson, Jeff, *Methane leaks erode green credentials of natural gas*, *Nature News* (Jan 2, 2013).

¹⁸⁹ *See* Council on Environmental Quality, Revised Draft Guidance for Greenhouse Gas Emissions and Climate Change Impacts 11 (Dec. 18, 2014), available at

<https://www.whitehouse.gov/administration/eop/ceq/initiatives/nepa/ghg-guidance> (instructing agencies to consider indirect and connected actions, including "downstream" emissions). Although the CEQ guidance is still in draft form and not binding, it is arbitrary for agencies to ignore its reasoning without explanation.

¹⁹⁰ *See* 40 C.F.R. §§ 1508.7, 1508.8; *Center for Biological Diversity v. Nat'l Highway Transp. Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008); *Utahns for Better Transp. v. U.S. Dep't of Transp.*, 305 F.3d 1152, 1176 (10th Cir. 2002); *Dine Citizens Against Ruining Our Env't v. U.S. Office of Surface Mining*, 82 F.Supp.3d 1201, 1212-14 (D. Colo. 2015).

the commitments enumerated in the Paris Agreement to “strengthen the global response to the threat of climate change.”¹⁹¹ The Paris Agreement codified the international consensus that the climate crisis is an urgent threat to human societies and the planet, with the parties recognizing that:

Climate change represents an *urgent and potentially irreversible threat to human societies and the planet* and thus requires the widest possible cooperation by all countries, and their participation in an effective and appropriate international response, with a view to accelerating the reduction of global greenhouse gas emissions (emphasis added).¹⁹²

Numerous authoritative scientific assessments have established that climate change is causing grave harms to human society and natural systems, and these threats are becoming increasingly dangerous. The Intergovernmental Panel on Climate Change (IPCC), in its 2014 Fifth Assessment Report, stated that: “Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased” and that “[r]ecent climate changes have had widespread impacts on human and natural systems.”¹⁹³

The 2014 Third National Climate Assessment, prepared by a panel of non-governmental experts and reviewed by the National Academy of Sciences and multiple federal agencies similarly stated that “That the planet has warmed is ‘unequivocal,’ and is corroborated through multiple lines of evidence, as is the conclusion that the causes are very likely human in origin”¹⁹⁴ and “[i]mpacts related to climate change are already evident in many regions and are expected to become increasingly disruptive across the nation throughout this century and beyond.”¹⁹⁵ The United States National Research Council similarly concluded that: “[c]limate change is occurring, is caused largely by human activities, and poses significant risks for—and in many cases is already affecting—a broad range of human and natural systems.”¹⁹⁶

The IPCC and National Climate Assessment further decisively recognize the dominant role of fossil fuels in driving climate change:

While scientists continue to refine projections of the future, observations unequivocally show that climate is changing and that the warming of the past 50

¹⁹¹ Paris Agreement, Art. 2(1).

¹⁹² Paris Agreement, Decision, Recitals.

¹⁹³ IPCC AR5 Synthesis Report at 2.

¹⁹⁴ Melillo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, Eds., 2014: Climate Change Impacts in the United States: The Third National Climate Assessment(U.S. Global Change Research Program). doi:10.7930/J0Z31WJ2 (“Third National Climate Assessment”) at 61 (quoting IPCC, 2007: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, S. Solomon, D. Qin, M. Manning, Z. Chen, M. Marquis, K. B. Averyt, M. Tignor, and H. L. Miller, Eds., Cambridge University Press, 1-18.).

¹⁹⁵ Third National Climate Assessment at 10.

¹⁹⁶ National Research Council, Advancing the Science of Climate Change (2010), available at www.nap.edu. (“Advancing the Science of Climate Change”) at 2.

years is primarily due to human-induced emissions of heat-trapping gases. These emissions come mainly from burning coal, oil, and gas, with additional contributions from forest clearing and some agricultural practices.¹⁹⁷

CO₂ emissions from fossil fuel combustion and industrial processes contributed about 78% to the total GHG emission increase between 1970 and 2010, with a contribution of similar percentage over the 2000–2010 period (*high confidence*).¹⁹⁸

These impacts ultimately emanating from the extraction and combustion of fossil fuels are harming the United States in myriad ways, with the impacts certain to worsen over the coming decades absent deep reductions in domestic and global GHG emissions. EPA recognized these threats in its 2009 Final Endangerment Finding under Clean Air Act Section 202(a), concluding that greenhouse gases from fossil fuel combustion endanger public health and welfare: “the body of scientific evidence compellingly supports [the] finding” that “greenhouse gases in the atmosphere may reasonably be anticipated both to endanger public health and to endanger public welfare.”¹⁹⁹ In finding that climate change endangers public health and welfare, EPA has acknowledged the overwhelming evidence of the documented and projected effects of climate change upon the nation:

Effects on air quality: “The evidence concerning adverse air quality impacts provides strong and clear support for an endangerment finding. Increases in ambient ozone are expected to occur over broad areas of the country, and they are expected to increase serious adverse health effects in large population areas that are and may continue to be in nonattainment. The evaluation of the potential risks associated with increases in ozone in attainment areas also supports such a finding.”²⁰⁰

Effects on health from increased temperatures: “The impact on mortality and morbidity associated with increases in average temperatures, which increase the likelihood of heat waves, also provides support for a public health endangerment finding.”²⁰¹

Increased chance of extreme weather events: “The evidence concerning how human induced climate change may alter extreme weather events also clearly supports a finding of endangerment, given the serious adverse impacts that can result from such events and the increase in risk, even if small, of the occurrence and intensity of events such as hurricanes and floods. Additionally, public health is expected to be adversely affected by an increase in the severity of coastal storm events due to rising sea levels.”²⁰²

Impacts to water resources: “Water resources across large areas of the country are at serious risk from climate change, with effects on water supplies, water quality, and adverse

¹⁹⁷ Third National Climate Assessment at 2.

¹⁹⁸ IPCC AR5 Synthesis Report at 46.

¹⁹⁹ Final Endangerment Finding, 74 Fed. Reg. at 66,497.

²⁰⁰ *Id.*

²⁰¹ *Id.*

²⁰² *Id.* at 66,497-98.

effects from extreme events such as floods and droughts. Even areas of the country where an increase in water flow is projected could face water resource problems from the supply and water quality problems associated with temperature increases and precipitation variability, as well as the increased risk of serious adverse effects from extreme events, such as floods and drought. The severity of risks and impacts is likely to increase over time with accumulating greenhouse gas concentrations and associated temperature increases.”²⁰³

Impacts from sea level rise: “The most serious potential adverse effects are the increased risk of storm surge and flooding in coastal areas from sea level rise and more intense storms. Observed sea level rise is already increasing the risk of storm surge and flooding in some coastal areas. The conclusion in the assessment literature that there is the potential for hurricanes to become more intense (and even some evidence that Atlantic hurricanes have already become more intense) reinforces the judgment that coastal communities are now endangered by human-induced climate change, and may face substantially greater risk in the future. Even if there is a low probability of raising the destructive power of hurricanes, this threat is enough to support a finding that coastal communities are endangered by greenhouse gas air pollution. In addition, coastal areas face other adverse impacts from sea level rise such as land loss due to inundation, erosion, wetland submergence, and habitat loss. The increased risk associated with these adverse impacts also endangers public welfare, with an increasing risk of greater adverse impacts in the future.”²⁰⁴

Impacts to energy, infrastructure, and settlements: “Changes in extreme weather events threaten energy, transportation, and water resource infrastructure. Vulnerabilities of industry, infrastructure, and settlements to climate change are generally greater in high-risk locations, particularly coastal and riverine areas, and areas whose economies are closely linked with climate-sensitive resources. Climate change will likely interact with and possibly exacerbate ongoing environmental change and environmental pressures in settlements, particularly in Alaska where indigenous communities are facing major environmental and cultural impacts on their historic lifestyles.”²⁰⁵

Impacts to wildlife: “Over the 21st century, changes in climate will cause some species to shift north and to higher elevations and fundamentally rearrange U.S. ecosystems. Differential capacities for range shifts and constraints from development, habitat fragmentation, invasive species, and broken ecological connections will likely alter ecosystem structure, function, and services, leading to predominantly negative consequences for biodiversity and the provision of ecosystem goods and services.”²⁰⁶

In addition to these acknowledged impacts on public health and welfare more generally, climate change is causing and will continue to cause serious impacts on natural resources that the Department of Interior is specifically charged with safeguarding.²⁰⁷

²⁰³ *Id.* at 66,498.

²⁰⁴ *Id.*

²⁰⁵ *Id.*

²⁰⁶ *Id.*; see also Third National Climate Assessment at 195-219.

²⁰⁷ See Federal Land Policy and Management Act of 1976, 43 U.S.C. §§ 1701(a)(8), 1712(c)(1); Multiple-Use Sustained Yield Act of 1960, 16 U.S.C. § 528; National Environmental Policy Act of 1969, 42 U.S.C. §§ 4331-4332.

Impacts to Public Lands: Climate change is causing and will continue to cause specific impacts to public lands ecosystem services. Although public lands provide a variety of difficult-to-quantify public benefits, one recent Forest Service attempt at quantification estimates the public land ecosystem services at risk from climate change at between \$14.5 and \$36.1 billion annually.²⁰⁸ In addition to the general loss of ecosystem services, irreplaceable species and aesthetic and recreational treasures are at risk of permanent destruction. High temperatures are causing loss of glaciers in Glacier National Park; the Park's glaciers are expected to disappear entirely by 2030, with ensuing warming of stream temperatures and adverse effects to aquatic ecosystems.²⁰⁹ With effects of warming more pronounced at higher latitudes, tundra ecosystems on Alaska public lands face serious declines, with potentially serious additional climate feedbacks from melting permafrost.²¹⁰ In Florida, the Everglades face severe ecosystem disruption from already-occurring saltwater incursion.²¹¹ Sea level rise will further damage freshwater ecosystems and the endangered species that rely on them.

Impacts to Biodiversity and Ecosystems: Across the United States ecosystems and biodiversity, including those on public lands, are directly under siege from climate change—leading to the loss of iconic species and landscapes, negative effects on food chains, disrupted migrations, and the degradation of whole ecosystems.²¹² Specifically, scientific evidence shows that climate change is already causing changes in distribution, phenology, physiology, genetics, species interactions, ecosystem services, demographic rates, and population viability: many animals and plants are moving poleward and upward in elevation, shifting their timing of breeding and migration, and experiencing population declines and extirpations.²¹³ Because climate change is occurring at an unprecedented pace with multiple synergistic impacts, climate change is predicted to result in catastrophic species losses during this century. For example, the IPCC concluded that 20% to 30% of plant and animal species will face an increased risk of extinction if global average temperature rise exceeds 1.5°C to 2.5°C relative to 1980-1999, with an increased risk of extinction for up to 70% of species worldwide if global average temperature exceeds 3.5°C relative to 1980-1999.²¹⁴

²⁰⁸ Esposito, Valerie et al., *Climate Change and Ecosystem Services: The Contribution and Impacts on Federal Public Lands in the United States*, USDA Forest Service Proceedings RMRS-P-64 at 155-164 (2011).

²⁰⁹ U.S. Environmental Protection Agency, *Climate Change and Public Lands* (1999).

²¹⁰ See National Climate Assessment at 48; MacDougall, A. H., et al., Significant contribution to climate warming from the permafrost carbon feedback, 5 *Nature Geoscience* 719-721 (2012), doi:10.1038/ngeo1573.

²¹¹ See National Climate Assessment at 592; Foti, R., Met al., Signs of critical transition in the Everglades wetlands in response to climate and anthropogenic changes, 110 *Proceedings of the National Academy of Sciences* 6296-6300, (2013), doi:10.1073/pnas.1302558110.

²¹² National Climate Assessment at 13.

²¹³ See Parmesan, C. and G. Yohe, A globally coherent fingerprint of climate change impacts across natural systems, 421 *Nature* 37-42 (2003); Root, T. et al., Fingerprints of global warming on wild animals and plants, 421 *Nature* 57-60 (2003); Chen, I. et al., Rapid range shifts of species associated with high levels of climate warming, 333 *Science* 1024-1026 (2011).

²¹⁴ IPCC, 2007.: *Synthesis Report: An Assessment of the Intergovernmental Panel on Climate Change*. Other studies have predicted similarly severe losses: 15%-37% of the world's plants and animals committed to extinction by 2050 under a mid-level emissions scenario, see Thomas et al., Extinction risk from climate change, 427 *Nature* 145-8 (2004)); the potential extinction of 10% to 14% of species by 2100 if climate change continues unabated, see Maclean, I. M. D. and R. J. Wilson, Recent ecological responses to climate change support predictions of high extinction risk, 108 *Proceedings of the National Academy of Sciences of the United States of America* 12337-12342 (2011); and the loss of more than half of the present climatic range for 58% of plants and 35% of animals by the

In sum, climate change, driven primarily by the combustion of fossil fuels, poses a severe and immediate threat to the health, welfare, ecosystems and economy of the United States. These impacts are felt across the nation, including upon the public lands the Secretary of the Interior is charged with safeguarding. A rapid and deep reduction of emissions generated from fossil fuels is essential if such threats are to be minimized and their impacts mitigated.

Although cost-benefit analysis is not necessarily the ideal or exclusive method for assessing contributions to an adverse effect as enormous, uncertain, and potentially catastrophic as climate change, BLM does have tools available to provide one approximation of external costs and has previously performed a “social cost of carbon” analysis in prior environmental reviews.²¹⁵ Its own internal memo identifies one available analytical tool: “For federal agencies the authoritative estimates of [social cost of carbon] are provided by the 2013 technical report of the Interagency Working Group on Social Cost of Carbon, which was convened by the Council of Economic Advisers and the Office of Management and Budget.”²¹⁶ As explained in that report:

The purpose of the “social cost of carbon” (SCC) estimates presented here is to allow agencies to incorporate the social benefits of reducing carbon dioxide (CO₂) emissions into cost-benefit analyses of regulatory actions that impact cumulative global emissions. The SCC is an estimate of the monetized damages associated with an incremental increase in carbon emissions in a given year. It is intended to include (but is not limited to) changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change.²¹⁷

2080s under the current emissions pathway, in a sample of 48,786 species, *see* Warren, R. J. et al., *Increasing Impacts of Climate Change Upon Ecosystems with Increasing Global Mean Temperature Rise*, 106 *Climatic Change* 141–77 (2011)..

²¹⁵ *See High Country Conserv'n Advocates v. United States Forest Serv.*, 2014 U.S. Dist. Lexis 87820 (D. Colo. 2014) (invalidating environmental assessment [“EA”] for improperly omitting social cost of carbon analysis, where BLM had included it in preliminary analysis); Taylor, P. “BLM crafting guidance on social cost of carbon -- internal memo,” *Greenwire*, April 15, 2015, available at <http://www.eenews.net/greenwire/stories/1060016810/>; BLM Internal Memo from Assistant Director of Resources and Planning Ed Roberson (“Roberson Internal Memo”), April 2015, available at http://www.eenews.net/assets/2015/04/15/document_gw_01.pdf (noting “some BLM field offices have included estimates of the [social cost of carbon] in project-level NEPA documents”) (accessed July 29, 2015); *see also* Council on Environmental Quality, *Revised Draft Guidance for Greenhouse Gas Emissions and Climate Change Impacts*, p. 18, available at www.whitehouse.gov/administration/eop/ceq/initiatives/nepa/ghg-guidance (accessed Jul 29, 2015) (quantitative analysis required if GHGs > 25k tons/yr).

²¹⁶ BLM, Roberson Internal Memo.

²¹⁷ *See* Interagency Working Group on Social Cost of Carbon, United States Government, Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis - Under Executive Order 12866, May 2013, available at https://www.whitehouse.gov/sites/default/files/omb/inforeg/social_cost_of_carbon_for_ria_2013_update.pdf (accessed July 29, 2015); *see also* Interagency Working Group on Social Cost of Carbon, United States Government, Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866, Feb. 2010, available at <http://www.epa.gov/otaq/climate/regulations/scc-tsd.pdf> (accessed July 29, 2015).

Further, other analytical tools exist to evaluate the cost of methane emissions.²¹⁸ EPA has peer reviewed and employed such a tool in its “Regulatory Impact Analysis of the Proposed Emission Standards for New and Modified Sources in the Oil and Natural Gas Sector.”²¹⁹

Leasing and development of unconventional wells could exact extraordinary financial costs to communities and future generations, setting aside the immeasurable loss of irreplaceable, natural values that can never be recovered. The EA fails to provide an accounting of these potential costs.

B. The EA Fails to Analyze the Auction’s Greenhouse Gas Impacts

The EA fails to fully analyze the impacts of increased oil and gas development on greenhouse gas emissions and climate change. It makes no attempt to even identify the various sources of greenhouse gas pollution that could result from new leasing, much less quantify potential emissions. It also incorrectly suggests that because “accurate” assessment of greenhouse gas emissions is not possible, it need not make any effort to quantify these emissions.

NEPA requires “reasonable forecasting,” which includes the consideration of “reasonably foreseeable future actions...even if they are not specific proposals” *N. Plains Res. Council, Inc. v. Surface Transp. Bd.*, 668 F.3d 1067, 1079 (9th Cir. 2011) (citation omitted). ***Full development of the areas for lease is entirely foreseeable in light of the Reasonably Foreseeable Development Scenarios for each of the field offices and existing development patterns. The EA notes that many of the areas for lease are in “high” or “very high” oil and gas potential areas. EA at 44, 78.*** It is therefore reasonably foreseeable that the leasing of these parcels will result in the commercial production of oil and gas. BLM must fully quantify the greenhouse gas emissions resulting from full commercial production, including emissions sources listed in section V.A above.

That BLM cannot “accurately” calculate the total emissions expected from full development is not a rational basis for cutting off its analysis. “Because speculation is . . . implicit in NEPA,” agencies may not “shirk their responsibilities under NEPA by labeling any and all discussion of future environmental effects as crystal ball inquiry.” *Id.* Indeed, the EA for a recent lease sale in Utah undercuts BLM’s assertion here that GHGs cannot be quantified at the leasing stage. *See* Fillmore EA at 57-58; *see also High Country Conservation Advocates v. United States Forest Serv.*, 52 F. Supp. 3d 1174, 1196 (D. Colo. 2014) (decision to forgo calculating mine’s reasonably foreseeable GHG emissions was arbitrary “in light of the agencies’ apparent ability to perform such calculations”). While the Utah sale EA does not provide a complete analysis, it estimates that sale of the Fillmore parcels will result in GHG emissions of

²¹⁸ See Marten A.L., Kopits K.A., Griffiths C.W., Newbold S.C., Wolverton A. 2014, online publication (2015, print publication). “Incremental CH4 and N2O mitigation benefits consistent with the US Government’s SC-CO2 estimates,” *Climate Policy* 15(2):272-298, abstract available at <http://www.tandfonline.com/doi/abs/10.1080/14693062.2014.912981>.

²¹⁹ See USEPA, Social Cost of Carbon, available at <http://www3.epa.gov/climatechange/EPAactivities/economics/scc.html> (noting application of social cost of methane supported by peer review); USEPA, Regulatory Impact Analysis of the Proposed Emission Standards for New and Modified Sources in the Oil and Natural Gas Sector, Ch. 4, available at http://www3.epa.gov/airquality/oilandgas/pdfs/og_prop_ria_081815.pdf.

7,074.54 metric tons of CO₂e per year, which includes emissions from the development of oil and gas. *Id.*

Even if it were true that potential emissions cannot reasonably be estimated, it is possible for BLM to identify significant sources of greenhouse gas emissions, which would enable the identification of specific measures to reduce emissions and an understanding of the extent to which certain emissions are avoidable. As alluded to above, the extreme urgency of the climate crisis requires BLM to pursue all means available to limit the climate change effects of its actions. Any emissions source, no matter how small, is potentially significant, such that BLM should fully explore mitigation and avoidance options for all sources.

Instead of performing this minimum level of analysis, the EA discusses in highly general terms the oil and gas industry's relative contribution to statewide greenhouse emissions. This provides no practical understanding of the major sources of emissions from oil and gas development and whether they can be controlled. BLM's discussion of mitigation measures is similarly unilluminating. It simply lists a random assortment of potential BMPs that may be applied to oil and gas projects. Without a breakdown of all potential sources, there can be no understanding of whether each source can be mitigated. For example, fugitive methane leaks from equipment and pipelines are an enormous source of emissions, but this source is ignored.

VI. Oil and Gas Development Harms Sensitive Species and Wildlife

The expansion of oil and gas development activities will harm wildlife through habitat destruction and fragmentation, stress and displacement caused by development-related activities (e.g., construction and operation activities, truck traffic, noise and light pollution), surface water depletion leading to low stream flows, water and air contamination, introduction of invasive species, and climate change. These harms can result in negative health effects and population declines. Studies and reports of observed impacts to wildlife from unconventional oil and gas extraction activities are summarized in the Center's "Review of Impacts of Oil and Gas Exploration and Development on Wildlife," submitted herewith.²²⁰ Because the allowance of destructive oil and gas extraction runs contrary to BLM's policy of managing resources in a manner that will "protect the quality of...ecological...values" and "provide...habitat for wildlife,"²²¹ a no-fracking alternative minimizing industrial development and its harmful effects on wildlife must be considered.

A. Habitat Loss

Oil and gas development creates a network of well pads, roads, pipelines, and other infrastructure that lead to direct habitat loss and fragmentation, as well as displacement of wildlife from these areas due to increased human disturbance. Habitat loss occurs as a result of a reduction in the total area of the habitat, the decrease of the interior-to-edge ratio, isolation of

²²⁰ See Center for Biological Diversity, Review of Impacts of Oil and Gas Exploration and Development on Wildlife (June 20, 2015). This review presents the findings of numerous studies and reports on the impacts of hydraulic fracturing on wildlife.

²²¹ 43 U.S. Code § 1701(a)(8).

one habitat fragment from another, breaking up of one habitat into several smaller patches of habitat, and decreasing the average size of a habitat patch. New research has revealed the extent of this habitat loss. For example, in the western United States, the amount of high-quality habitat for the pronghorn has shrunk drastically due to oil and gas development.²²²

The indirect effects from unconventional oil and gas development can often be far greater than the direct disturbances to habitat. The impacts from the well site—including noise, light, and pollution—extend beyond the borders of the operation site and will consequently render even greater areas uninhabitable for some wildlife. Species dependent on having an “interior” habitat will lose their habitat as operation sites or other infrastructure fragment previously buffered and secluded areas. These and other indirect effects can be far greater than the direct disturbances to land. In the Marcellus shale of Pennsylvania, for instance, research shows that 8.8 acres of forest on average are cleared for each drilling pad along with associated infrastructure, but after accounting for ecological edge effects, each drilling station actually affected 30 acres of forest.²²³

While individual well sites may cause some disturbance and destruction, the cumulative impacts of oil and gas production using unconventional methods must receive attention as well. While the actual well pads may only occupy a small proportion of a particular habitat, their impact can be much greater when their aggregate impact is considered. As discussed above, interior habitats will be destroyed by removing the buffer between the interior habitat and the operation site. For example, one study found that grassland bird species’ habitat have been degraded by oil development in the Bakken shale region, as evidenced by their avoidance of these areas. Grassland birds avoided areas within 150 meters of roads, 267 meters of single-bore well pads, and 150 meters of multi-bore well pads.²²⁴ In areas of dense development, these habitat effects are greatly multiplied for sensitive species, such as the Sprague's pipit (*Anthus spragueii*), which avoided areas within 350 meters of single-bore well pads. The EIS must quantify the potential cumulative loss of habitat for sensitive species.²²⁵

B. Water Depletion

Water depletion also affects species whose habitats are far removed from the actual well site. Because of the high volume of water required for even a single well that uses unconventional extraction methods, the cumulative water depletion has a significant impact on species that rely on water sources that serve to supply oil and gas operations. In addition, water depletion adversely impacts water temperature and chemistry, as well as amplifies the effects of harmful pollutants on wildlife that would otherwise be diluted without the depletion.

²²² Beckmann, J.P. et al. Human-mediated shifts in animal habitat use: Sequential changes in pronghorn use of a natural gas field in Greater Yellowstone, 147 *Biological Conservation* 1:222 (2012).

²²³ Johnson, N., Pennsylvania energy impacts assessment: Report 1: Marcellus shale natural gas and wind, Nature Conservancy – Pennsylvania Chapter (2010) at 10.

²²⁴Thompson, Sarah J. et al. Avoidance of unconventional oil wells and roads exacerbates habitat loss for grassland birds in the North American great plains, *Biological Conservation* 192 (2015) 82–90, *available at* https://www.researchgate.net/publication/282292567_Avoidance_of_unconventional_oil_wells_and_roads_exacerbates_habitat_loss_for_grassland_birds_in_the_North_American_great_plains.

²²⁵ *Id.*

C. Water Contamination

Accidental spills or intentional dumping of wastewater contaminate surface water and cause large-scale harm to wildlife. Numerous incidents of wastewater contamination from pipelines, equipment blowouts, and truck accidents have been reported, and have resulted in kills of fish, aquatic invertebrates, and trees and shrubs, as well as negative health effects for wildlife and domestic animals. In 2013, a company admitted to dumping wastewater from fracking operations into the Acorn Fork Creek in Kentucky, causing a massive fish kill.²²⁶ Among the species harmed was the blackside dace, a threatened minnow species.²²⁷ An analysis of water quality of Acorn Creek and fish tissues taken shortly after the incident was exposed showed the fish displayed general signs of stress and had a higher rate of gill lesions, than fish in areas not affected by the dumping.²²⁸ The discharge of fracking wastewater into the Susquehanna River in Pennsylvania is suspected to be the cause of fish abnormalities, including high rates of spots, lesions, and intersex.²²⁹ In West Virginia, the permitted application of hydrofracturing fluid to an area of mixed hardwood forest caused extensive tree mortality and a 50-fold increase in surface soil concentrations of sodium and chloride.²³⁰

In addition, open air pits that store waste fluid pose risks for wildlife that may come into contact with the chemicals stored in the pits. Already, there have been several documented cases of animal mortality resulting from contact with pits. A field inspection of open pits in Wyoming found 269 bird carcasses, the likely cause of death being exposure to toxic chemicals stored in the open pits.²³¹ Open pits can also serve as breeding grounds for mosquitoes, which serve as a vector for West Nile virus, a threat to humans and animals alike. In Wyoming, an increase of ponds led to an increase of West Nile virus among greater sage-grouse populations.²³² Recently, new information has come to light that operators in California have been dumping wastewater into hundreds of unpermitted open pits.²³³ The EIS must take into account the impact of both unpermitted, illegal waste pits as well as those that are regulated.

Contaminants from spills not only directly harm species exposed to these contaminants but can enter the food chain and harm predators. A recent study found that in watersheds where hydraulic fracturing occurs, a top predator, riparian songbird in headwater systems, the

²²⁶ Vaidyanathan, Gayathri, *Fracking Spills Cause Massive Ky. Fish Kill*, E&E News, Aug. 29, 2013, <http://www.eenews.net/greenwire/2013/08/29/stories/1059986559> (accessed July 30, 2015).

²²⁷ *Id.*

²²⁸ Papoulias, D.M. and A.L. Velasco. Histopathological analysis of fish from Acorn Fork Creek, Kentucky, exposed to hydraulic fracturing fluid releases, 12 *Southwestern Naturalist* (Special Issue 4):92 (2013).

²²⁹ Piette, Betsy, BP Oil Spill, Fracking Cause Wildlife Abnormalities, *Workers World* (April 27, 2012) available at http://www.workers.org/2012/us/bp_oil_spill_fracking_0503/; Pennsylvania Fish & Boat Commission, Ongoing Problems with the Susquehanna River smallmouth bass, a Case for Impairment (May 23, 2012), www.fish.state.pa.us/newsreleases/2012press/senate_susq/SMB_ConservationIssuesForum_Lycoming.pdf

²³⁰ Adams, Mary Beth, Land Application of Hydrofracturing Fluids Damages a Deciduous Forest Stand in West Virginia, 40 *Journal of Environmental Quality* 1340 (2011).

²³¹ *See, e.g.*, Ramirez, P. Jr., Bird Mortality in Oil Field Wastewater Disposal Facilities, 46 *Environ Mgmt* 5: 820 (2010).

²³² Zou, Li et al., Mosquito Larval Habitat Mapping Using Remote Sensing and GIS: Implications of Coalbed Methane Development and West Nile Virus, 43 *J. Med. Entomol.* 5:1034 (2006) (“Zou 2006”).

²³³ Cart, Julie. *Hundreds of Illicit Oil Wastewater Pits Found in Kern County*, (Feb. 26, 2015), available at <http://www.latimes.com/local/lanow/la-me-ln-pits-oil-wastewater-20150226-story.html>.

Louisiana Waterthrush (*Parkesia motacilla*), accumulated metals associated with the fracking process. “In both the Marcellus and Fayetteville shale regions, barium and strontium were found at significantly higher levels in feathers of birds in sites with fracking activity than at sites without fracking.”²³⁴ While the study did not resolve the pathway for these metals entering the food chain, their findings suggested that “hydraulic fracturing may be contaminating surface waters and underscores the need for additional monitoring and study to further assess ecological and human health risks posed by the increasingly widespread development of unconventional sources of natural gas around the world.”²³⁵

D. Invasive Species

Invasive species may be introduced through a variety of pathways that would be increasingly common if oil and gas activity is allowed to expand. Machinery, equipment, and trucks moved from site to site can carry invasive plant species to new areas. In addition, materials such as crushed stone or gravel transported to the site from other locations may serve as a conduit for invasive species to migrate to the well site or other areas en route.

Aquatic invasive species may also spread more easily given the large amounts of freshwater that must be transported to accommodate new drilling and extraction techniques. These species may be inadvertently introduced to new habitats when water is discharged at the surface. Alternatively, hoses, trucks, tanks, and other water use equipment may function as conduits for aquatic invasive species to access new habitats.

E. Climate Change

Anthropogenic climate change poses a significant threat to biodiversity.²³⁶ Climate disruption is already causing changes in distribution, phenology, physiology, genetics, species interactions, ecosystem services, demographic rates, and population viability: many animals and plants are moving poleward and upward in elevation, shifting their timing of breeding and migration, and experiencing population declines and extinctions.²³⁷ Because climate change is occurring at an unprecedented pace with multiple synergistic impacts, climate change is predicted to significantly increase extinction risk for many species. The IPCC concludes that it is

²³⁴ Latta, Steven C., et al., Evidence from two shale regions that a riparian songbird accumulates metals associated with hydraulic fracturing,” *Ecosphere* vol. 6(9), Article 144 (September 2015), available at <http://www.esajournals.org/doi/pdf/10.1890/ES14-00406.1>.

²³⁵ *Id.*

²³⁶ Warren, R. et al., Quantifying the benefit of early climate change mitigation in avoiding biodiversity loss, 3 *Nature Climate Change* 678 (2013) (“Warren 2013”).

²³⁷ Cahill, A.E. et al., How Does Climate Change Cause Extinction? *Proceedings of the Royal Society B*, doi:10.1098/rspb.2012.1890 (2012); Chen, I. et al., Rapid range shifts of species associated with high levels of climate warming, 333 *Science* 1024 (2011); Maclean, I.M.D., and R.J. Wilson, Recent ecological responses to climate change support predictions of high extinction risk, 108 *Proc. Natl. Acad. Sci. Early Edition* 12337 (2011) (“Maclean and Wilson 2011”); Parmesan, C., Ecological and Evolutionary Responses to Recent Climate Change, 37 *Annual Review of Ecology Evolution & Systematics* 637 (2006); Parmesan, C., and G. Yohe, A globally coherent fingerprint of climate change impacts across natural systems, 421 *Nature* 37 (2003); Root, T.L. et al., Fingerprints of Global Warming on Wild Animals and Plants, 421 *Nature* 57 (2003); Warren, Rachel et al., Increasing Impacts of Climate Change Upon Ecosystems with Increasing Global Mean Temperature Rise, 106 *Climatic Change* 141 (2011). (“Warren 2011”).

extremely likely that climate change at or above 4°C will result in substantial special extinction.²³⁸ Other studies have predicted similarly severe losses: 15-37 percent of the world's plants and animals committed to extinction by 2050 under a mid-level emissions scenario²³⁹; the extinction of 10 to 14 percent of species by 2100 if climate change continues unabated.²⁴⁰ Another recent study predicts the loss of more than half of the present climatic range for 58 percent of plants and 35 percent of animals by the 2080s under the current emissions pathway, in a sample of 48,786 species.²⁴¹ Because expansion of oil and gas production in the planning area will substantially increase the emissions of greenhouse gases, this activity will further contribute to the harms from climate change to wildlife and ecosystems.

F. Population-level Impacts

Oil and gas development has been linked to population-level impacts on wildlife, including lower reproductive success of sage grouse and declines in the abundance of songbirds and aquatic species. For example, young greater-sage grouse avoided mating near infrastructure of natural-gas fields, and those that were reared near infrastructure had lower annual survival rates and were less successful at establishing breeding territories compared to those reared away from infrastructure.²⁴² In Wyoming, an increasing density of wells was associated with decreased numbers of Brewer's sparrows, sage sparrows, and vesper sparrows.²⁴³ In the Fayetteville Shale of central Arkansas, the proportional abundance of sensitive aquatic taxa, including darters, was negatively correlated with gas well density.²⁴⁴ The EIS must consider the population-level impacts that oil and gas development may have on wildlife in the planning areas.

G. Endangered, Threatened, and Sensitive Species

BLM must use the existing readily available data to identify which sensitive species that are of critical concern with regards to the lands included in, or in immediate proximity to, the proposed sale parcels. BLM's EIS must disclose any potential direct, indirect or cumulative impacts to such species, including the Pallid Sturgeon (*Scaphirhynchus albus*); Least Tern (*Sterna antillarum*); Piping Plover (*Charadrius melodus*); Whooping Crane (*Grus americana*); Red Knot (*Calidris canutus rufa*) and Black-footed Ferret (*Mustela nigripes*).

In addition, BLM must consult with the Service regarding the impacts of the lease sale on affected listed species, in compliance with its section 7 obligations under the ESA. To the extent that BLM relies on its section 7 programmatic consultations for the several management plans governing the lease sale, that reliance is not proper for any of the listed species affected by

²³⁸ Intergovernmental Panel on Climate Change, *Climate Change 2014: Synthesis Report, Summary for Policy Makers IPCC Fifth Assessment Synthesis Report*, 18 (2014).

²³⁹ Thomas, C.D. et al., *Extinction Risk from Climate Change*, 427 *Nature* 8:145 (2004).

²⁴⁰ Maclean and Wilson 2011.

²⁴¹ Warren 2013.

²⁴² Holloran, M.J. et al., *Yearling Greater Sage-Grouse Response to Energy Development in Wyoming*, 74 *Journal of Wildlife Management* 1:65 (2010).

²⁴³ Gilbert, Michelle M. & Anna D. Chalfoun, *Energy Development Affects Populations of Sagebrush Songbirds in Wyoming*, 75 *The Journal of Wildlife Management* 4:816 (2011).

²⁴⁴ Green, Jessie J. et al., *Abstract: Examining Community Level Variables of Fishes in Relation to Natural Gas Development*, Southeastern Fishes Council, Annual Meeting Program, November 8 - 9, 2012, New Orleans, Louisiana (2012).

BLM's action. The potential for fracking and horizontal drilling and its associated impacts within the planning area constitutes "new information reveal[ing] effects of the [RMPs] that may affect listed species or critical habitat in a manner or to an extent not previously considered [in the prior section 7 programmatic consultations]." 50 CFR § 402.16(b). BLM must therefore reinitiate consultation on all of the planning documents for these areas. In any case, it must formally consult over the lease sale's potential adverse effects on listed species and consider the full scope of fracking and other drilling activities that could affect these species.

H. The EA Fails to Properly Evaluate the Impacts of New Development on Wildlife

The EA completely fails to analyze site-specific impacts of oil and gas development on important wildlife areas, including habitat for the sensitive Sprague's Pipit and other grassland bird.

1. Sage Grouse Habitat

We commend the BLM's decision to defer leasing of lands identified as Priority or General Habitat for the Greater Sage-Grouse. Consistent with the decision in the 2015 HiLine Sage-Grouse RMP Amendments, BLM should continue to prioritize oil and gas development outside of identified Priority and General Habitat.

2. Sprague's Pipit and Grassland Birds

BLM acknowledges that habitat for the BLM Montana sensitive species Sprague's Pipit is present within the following proposed lease parcels:

105431-LB, 105431-K6, 105431-LL, 105431-LF, 105431-LE, 105431-LD, 97300-BO, 97300-CC, 105431-KA, 105431-KB, 105431-KC, 105431-KD, 105431-LH, 105431-LJ, 102757-WC, 105431-HU, 105431-HV, 102757-QH, 102757-J7, 102757-J8, 102757-KC, 102757-KE, 105431-Q3, 102757-GW, 102757-G4, 102757-G6, 791010-ZT, 102757-QU, 79010-ZR, 79010-ZS, 79010-7J, 102757-RM, 102757-6K, 79010-A9, 79010-B2, 105431-FK, 105431-FL, 105431-FM, 105431-FN, 105431-FP, 79010-A2, 105431-K4, 79010-B9, 79010-C1, 105431-FQ, 105431-FT, 105431-FU, 105431-FV, 105431-FW, 105431-FR

BLM's failure to consider site-specific impacts to the Sprague's Pipit violates its own regulations regarding conservation of sensitive species.

The Sprague's pipit (*Anthus spragueii*) is a native grassland specialist and is one of only 12 birds endemic to the Great Plains grasslands. The bird breeds in the northern prairie regions of the United States and Canada and winters in parts of the U.S. southwest east to Louisiana and south through northern Mexico.

The Sprague's pipit depends on large patches of open, native grassland. The Northern Plains have lost up to 99% of native grasslands in the Sprague's pipit's breeding grounds. Drainage of wetlands has further resulted in a 50% loss of wetland and wet meadow habitat used by the pipit. In the bird's wintering range, habitat degradation by tree, shrub, and weed encroachment is a particular problem, along with permanent habitat loss to human uses of the land. Climate change is and will continue to exacerbate all of these threats to pipit habitat and will also change natural fire cycles to the detriment of the bird.

Due to this loss of habitat, the Sprague's pipit has experienced a 79% population drop across its range. The population has been declining at an average rate of 4.1% since 1966, when the Breeding Bird Survey (BBS) began monitoring bird population trends.²⁴⁵

The Sprague's pipit is particularly sensitive to anthropogenic disturbance. The birds avoid roads, for example. Sprague's pipits have a strong preference for native grasses over exotic species such as smooth brome (*Bromus inermis*) and crested wheatgrass (*Agropyron cristatum*).²⁴⁶ Increased oil and gas exploration and extraction have likely already increased disturbances and habitat loss throughout the pipit's range.

Many grassland birds are experiencing catastrophic declines. Knopf described the magnitude of avian losses:

During the last 25 years, grassland species have shown steeper, more consistent, and more geographically widespread declines than any other behavioral or ecological guild of North American birds, including Neotropical migrants.²⁴⁷

Similarly, Peterjohn and Sauer proclaimed, "...the potential for species extinctions in grasslands is relatively high; for example, populations of grassland birds are declining more precipitously than other groups of North American bird species."²⁴⁸ The Sprague's pipit is one of these birds at risk. Wells described the Sprague's pipit as, "one of the fastest declining songbirds of North America."²⁴⁹

The Sprague's pipit is particularly vulnerable during the spring and summer months. Nest building generally begins in mid-May, and clutching can start from the second week of May through July.²⁵⁰ Fledging occurs from around June 13 through the end of August.²⁵¹ Sprague's pipits have a low frequency of re-nesting and high rates of nest abandonment.²⁵²

²⁴⁵ Sauer, J. R., J. E. Hines, and J. Fallon. 2005. The North American Breeding Bird Survey, Results and Analysis 1966 - 2005. Version 6.2.2006. Laurel, MD: USGS Patuxent Wildlife Research Center.

²⁴⁶ Madden, E. M. 1996. Passerine communities and bird-habitat relationships on prescribe-burned, mixed-grass prairie in North Dakota. M.S. thesis, Montana State Univ., Bozeman; Prescott, D. R. C. and G. M. Wagner. 1996. Avian responses to implementation of a complimentary/rotational grazing system by the North American Waterfowl Management Plan in southern Alberta: the Medicine Wheel project. Alberta NAWMP Centre. NAWMP-018. Edmonton, Alberta; Prescott, D. R. C., R. Arbuckle, B. Goddard and A. Murphy. 1993. Methods for monitoring and assessment of avian communities on NAWMP landscapes in Alberta, and 1993 results. Alberta NWMP Centre. NAWMP-007. Edmonton, Alberta;

²⁴⁷ Knopf, F.L. 1994. Avian assemblages on altered grasslands. *Studies in Avian Biology*. 15: 247-257.

²⁴⁸ Peterjohn, B.G., and J.R. Sauer. 1999. Population status of North American grassland birds from the North American Breeding Bird Survey, 1966 -1996. *Studies in Avian Biology*. 19:27-44.

²⁴⁹ Wells, J.V. 2007. *Birder's Conservation Handbook: 100 North American Birds at Risk*. Princeton University Press.

²⁵⁰ Maher, W. J. 1973. *Birds: I. Population dynamics*. Canadian Committee for the International Biological Programme (Matador Project) Technical Report no. 34. Univ. of Saskatchewan, Saskatoon.

Oil and gas exploration and extraction is likely a severe threat to Sprague's pipit's habitat. The imposition of infrastructure for oil and gas extraction facilitates the spread of weeds and establishes structures and roads that pipits avoid. Specifically, mineral extraction development causes habitat fragmentation that perpetuates and exacerbates degradation. According to a U.S. Forest Service technical report,

The potential effects of petroleum development on wildlife in wildland environments are numerous and varied... The major wildlife groups affected... are ungulates, carnivores, water birds, upland birds and raptors.²⁵³

Possible environmental disruption that would adversely affect Sprague's pipit includes, but is not limited to: noise pollution, human intrusion, alteration of vegetation and land and introduction of harmful substances. Habitat alteration from oil and gas development, one of the greater threats to Sprague's pipit, is caused by seismic trail clearing, clearing and grading of right of ways, site development, excavation of storage and mud pits, borrow pit excavation, construction of process, treatment and storage facilities, installation of flow lines, erection of power lines, communication systems development, trenching and pipe installation, pipe burial and backfill, effluent accidents and development of ancillary industry (i.e., boomtowns associated with labor forces).²⁵⁴

Effects from secondary activities may be greater in the long term than those from development itself. It is possible that disrupted ecosystems may never be totally rehabilitated, as human settlement occurring during development and production may persist, and invasive grass species may diminish viable habitat. Moreover, impacts will have been cumulative over many years during the life of an oil field.

Oil and gas facilities can cause direct mortality as well. There are reports from several state governments of avian deaths in extraction pits. These were caused when birds 1) were coated with oil from the pit and their flight was thereby impeded; 2) ingested toxic substances when drinking in the pits; and 3) drowned in the pits.²⁵⁵ Avian species are also susceptible to moderate mortality rates from collisions with overhead power lines associated with increased oil and gas and other human activities.²⁵⁶ Linnen (2008) examined the effects of oil and gas disturbances, including road establishment, and suggested that Sprague's Pipits tended to occur in lower numbers and at fewer sites near natural gas wells and trails than in interior habitat patches. According to the Service's Sprague's pipit conservation plan,

²⁵¹ *Id.*

²⁵² Sutter, G.C., D.J. Sawatzky, D. M. Cooper and R. M. Brigham. 1996. Renesting intervals in Sprague's Pipit, *Anthus spragueii*. *Can. Field-Nat.* 110: 1-4.

²⁵³ Bromley, M. 1985. Wildlife management implications of petroleum exploration and development in wildland environments. U.S. Forest Service Technical Report INT-191.

²⁵⁴ *Id.*

²⁵⁵ *Id.*

²⁵⁶ *Id.*

Energy exploration and extraction are expected to continue to be a threat to Sprague's Pipits habitat and populations into the future as demands for resources increase globally (Environment Canada 2008). Sprague's Pipits abundance decreases within 300 m of oil wells (Linnen 2008).

Currently, no regulatory mechanisms exist for many of these activities to ensure that drilling and associated activities avoid nesting habitat. In the United States, much of the Sprague's Pipit's breeding range overlaps major areas of oil production in eastern Montana, western North Dakota and northwestern South Dakota. Areas with a high density of oil production may also decrease migration and wintering habitats available.²⁵⁷

The Service further found that “[e]xpanding energy development (wind energy and oil and gas) in grassland regions may result in increased noise levels and subsequently interfere with male song in Sprague's Pipits. The effect of anthropogenic noise on Sprague's Pipit breeding success is unmeasured.”²⁵⁸

Sprague's pipit are found within the HiLine planning area, with viable habitat within several of the proposed lease parcels.²⁵⁹ The EA acknowledges that “All of the nominations in Phillips County provide medium to high value habitat for grassland birds such as Sprague's Pipit, Long-billed Curlew and Baird's Sparrow.”²⁶⁰ No analysis has been provided as to the actual amount of habitat that would be impacted by the proposed leasing.

Significant new research since the Service's 2010 warranted but precluded finding shows that the unconventional (i.e., fracking) techniques now at play in the Bakken shale and elsewhere cause even greater levels of disruption to Sprague's pipit habitat use and breeding than previously understood.²⁶¹

U.S. Geological Survey and other researchers examined oil infrastructure (“Single-bore well pads, developed with hydraulic fracturing and horizontal drilling, were the most common oil-related infrastructure on the landscape at the time of the study”) and conducted bird surveys in the Williston Basin and Bakken formations of North Dakota and eastern Montana.²⁶² Their analysis of grassland bird densities showed avoidance of infrastructure to various degrees by

²⁵⁷ U.S. Fish and Wildlife Service, Sprague's Pipit (*Anthus spragueii*) Conservation Plan at 20 (2010) (citing Linnen, C.G. 2008. Effects of oil and gas development on grassland birds. Unpublished report, prepared for Petroleum Technology Alliance Canada. Saskatoon, Saskatchewan, Canada.)

²⁵⁸ *Id.*

²⁵⁹ U.S. Fish and Wildlife Service, 12-Month Finding on a Petition to List Sprague's Pipit as Endangered or Threatened Throughout Its Range, 75 Fed. Reg. 56,028 (Sept. 15, 2015).

²⁶⁰ EA at 25

²⁶¹ See Sarah J. Thompson *et al.*, Avoidance of unconventional oil wells and roads exacerbates habitat loss for grassland birds in the North American great plains, 192 Biological Conservation 82-90 (2015).

²⁶² *Id.* at 83-85.

different grassland bird species, but confirmed that Sprague's pipit in particular avoided infrastructure by 350 meters.²⁶³

As a result of this extensive avoidance distance, researchers found that “[b]ecause negative effects extend into surrounding habitat, variation in well and road configurations can dramatically alter the amount of habitat that will remain suitable for grassland birds as oil development continues in the region.”²⁶⁴ Their research concluded that “of endemic grassland birds, Sprague's pipit is one of the most sensitive to disturbances associated with oil development, raising further concern about the impact of ongoing oil development in the region.”²⁶⁵ Further, they recommended potential strategies and avenues of research for determining whether alternative patterns of development (scattered single-bore wells versus corridors and multi-bore pads) might mitigate this sensitivity.

The updated EA acknowledges none of this. It then proceeds to defer all analysis and consultation to the drilling permit stage:

Effects to migratory birds from oil and gas development at the APD stage could include direct loss of habitat from roads, well pads and other infrastructure, disturbance, power line strikes and accidental direct mortality, fragmentation of habitat, change in use of habitats, and potential threats and competition from edge species. Mitigation measures would be assigned at the APD stage to ensure there would be no measurable negative effect on migratory bird populations, in compliance with Executive Order 13186 and MBTA. These mitigation measures would be required as Conditions of Approval.²⁶⁶

This piecemeal approach to analysis and consultation is squarely foreclosed by the Ninth Circuit's decision in *Conner v. Burford*, 848 F.2d 1441, 1454-57 (9th Cir. 2012), where the court found that it was improper to exclude the potential effects of future lessee activity when reviewing the leasing phase for oil and gas permits on public lands.

Moreover, BLM's attempt to defer analysis of the potential impacts to Sprague's pipit to the APD stage is in direct violation of BLM's regulations regarding Bureau sensitive species as set forth in BLM Manual 6840 - Special Status Species Management.

Pursuant to Manual 6840, “[a]ll Federal candidate species, proposed species, and delisted species in the 5 years following delisting will be conserved as Bureau sensitive species.”²⁶⁷ The Objective of Manual 6840 is “[t]o initiate proactive conservation measures that reduce or eliminate threats to Bureau sensitive species to minimize the likelihood of and need for listing of

²⁶³ *Id.* at 86.

²⁶⁴ *Id.* at 86.

²⁶⁵ *Id.* at 89.

²⁶⁶ EA at 49.

²⁶⁷ Manual 6840 at § .01.

these species under the ESA.”²⁶⁸ Manual 6840 further states that it is the BLM’s Policy to promote the “conservation and to minimize the likelihood and need for listing” Bureau sensitive species.²⁶⁹ Piecemeal analyses of individual lease sales does not provide the appropriate perspective for examining and developing the proactive conservation measures necessary to reduce or eliminate threats to Sprague’s pipit from oil and gas leases.

Furthermore, pursuant to Manual 6840 it is the responsibility of State Directors to not only inventory BLM lands to determine the occurrence of BLM special status species, but also to determine “the condition of the populations and their habitats, and how discretionary BLM actions affect those species and their habitats.”²⁷⁰ The leasing of federal lands for oil and gas extraction is a discretionary BLM action that has the potential to adversely affect Sprague’s pipit. Deferring an analysis of the potential effects of selling oil and gas leases to the APD stage is entirely inconsistent with the requirements of Manual 6840. If a lease is sold, the lessee acquires certain contractual rights constraining BLM authority. For example, according to 43 C.F.R. § 3101.1-2, once a lease is issued to its owner, that owner has the “right to use as much of the lease lands as is necessary to explore for, drill for, mine, extract, remove and dispose of the leased resource in the leasehold” subject to specific nondiscretionary statutes and lease stipulations. Therefore, once the lease is sold, it will be too late for BLM to ensure that sufficient protections will be in place to protect this species from the cumulative impacts of extraction-related activities.

Furthermore, pursuant to Manual 6840 Bureau sensitive species are considered BLM special status species, and Section 2 of the Manual provides specific measures that BLM is required to undertake in order to “conserve these species and their habitats.”²⁷¹ To implement this section, BLM “shall... minimize or eliminate threats” affecting Bureau sensitive species, by determining their current threats and habitat needs, and ensuring that BLM activities “are carried out in a way that is consistent with its objectives for managing those species and their habitats at the appropriate spatial scale.”²⁷² Due to the potential harms from habitat loss and fragmentation, the appropriate spatial scale for determining threats to Sprague’s pipit from oil and gas development is the entire area subject to lease sales, rather than the piecemeal, limited APD-specific review that BLM is attempting to employ. The need for a broader analysis to assess the threats to this species from the lease sale itself is further supported by Manual 6840’s requirement that BLM work with partners and stakeholders to “develop species-specific or ecosystem-based conservation strategies,” and in the absence of such strategies, to incorporate standard operating procedures and other conservation measures “to mitigate specific threats to Bureau sensitive species during the planning of activities and

²⁶⁸ *Id.* at § .02 (emphasis added).

²⁶⁹ *Id.* at § .06.

²⁷⁰ *Id.* at § .04.

²⁷¹ *Id.* at § .2 (“All federally designated candidate species, proposed species, and delisted species in the 5 years following their delisting shall be conserved as Bureau sensitive species.”).

²⁷² *Id.* at § .2(C) (emphasis added).

projects.²⁷³ Postponing any analysis of impacts to Sprague’s pipit until the later APD stage forecloses the implementation of standard procedures and conservation measures necessary to mitigate threats to the species during exploration or other actions that might take place prior to an APD being filed, since as noted above once a lease is issued, the owner has the “right to use as much of the lease lands as is necessary to explore for, drill for, mine, extract, remove and dispose of the leased resource in the leasehold.”²⁷⁴

Moreover, the development of species-specific and ecosystem-based conservation strategies implicitly necessitates a more holistic review of the cumulative impacts of the proposed lease sale, which cannot be accomplished through site-specific APD-stage analysis alone. And, piecemeal analyses of individual lease sales do not provide the appropriate perspective for examining the cumulative effects of hydraulic fracturing and climate change impacts at the regional and landscape scale and for making land management decisions.

Where activities have the potential to adversely impact species of concern, the general practice is to consider those impacts and address them “at the earliest possible time,” in order to avoid delay, ensure that impacts are avoided and opportunities for mitigation are not overlooked.²⁷⁵ This is likewise true in the context of even more general environmental review, such as under NEPA.²⁷⁶ Furthermore, it is general practice to evaluate the impacts of several related projects with cumulative impacts proposed or reasonably foreseeable in the same geographic region in a single, comprehensive, analysis.²⁷⁷ Likewise, under the ESA an analysis of the effects of an action must consider actions that are interrelated or interdependent.²⁷⁸ This suggests that BLM should consider the effects of oil and gas extraction activities at the lease sale stage, since those actions are inherent in leasing land for such purposes. It is therefore evident that in order to effectuate the policy of protecting Bureau sensitive species set forth in Manual 6840,²⁷⁹ and consistent with the established practice of early, comprehensive review of potential impacts to sensitive species, BLM must consider impacts to Sprague’s pipit at the lease sale, rather than waiting until the APD stage for project specific review.

²⁷³ *Id.* (emphasis added).

²⁷⁴ 43 C.F.R. § 3101.1-2.

²⁷⁵ *See i.e.* 50 C.F.R. §§ 402.14(a), (g)(8).

²⁷⁶ *See* 40 C.F.R. § 1501.2 (“Agencies shall integrate the NEPA process with other planning at the earliest possible time to insure that planning and decisions reflect environmental values, to avoid delays later in the process, and to head off potential conflicts.”).

²⁷⁷ *See Kleppe v. Sierra Club*, 427 U.S. 390, 410 (1976) (“when several proposals for . . . actions that will have cumulative or synergistic environmental impact upon a region are pending concurrently before an agency, their environmental consequences must be considered together.”).

²⁷⁸ 50 C.F.R. §§ 402.14 and 402.02.

²⁷⁹ *See* BLM Manual 6840 at .06 (“Bureau sensitive species will be managed consistent with species and habitat management objectives in land use and implementation plans to promote their conservation and to minimize the likelihood and need for listing under the ESA.”).

In sum, BLM has issued regulations in Manual 6840 that require the agency to undertake actions to protect candidate species, much like they protect proposed and listed species. Delaying an analysis of impacts to Sprague's pipit until the APD stage risks harm to an at-risk species that could otherwise be avoided. A failure to address the impacts to Sprague's pipit at the lease sale stage violates BLM's own regulations set forth in Manual 6840, is entirely inconsistent with established practice and policies regarding species protection, and is therefore arbitrary and capricious agency action under the Administrative Procedures Act.

3. BLM Must Consult Over the Impacts of Fracking on the Endangered Fish

Oil and gas activities within the parcels for sale may affect endangered pallid sturgeon and its critical habitat, including habitat downstream of those areas for lease. The EIS must discuss the impacts of new leasing on the pallid sturgeon, including greater water depletions and the increased risk of spills and water contamination that could result from horizontal drilling and hydraulic fracturing. As the lease sale is reasonably certain to result in new oil and gas development, BLM must also consult with the Service regarding these potential harms to the endangered fish, in compliance with section 7 of the ESA.

Spills and leaks will certainly increase with the addition of new wells in the proposed areas for lease. The EA states that the lease parcels themselves do not contain habitat for the pallid sturgeon, EA at 23, but contains no analysis whatsoever of whether the lease parcels contain or adjoin waters that drain into pallid sturgeon habitat.

BLM's and the Service's analysis of the lease sale's effects on endangered fish must also account for the unprecedented sheer volume of chemicals and wastewaters that will be generated by increased hydraulic fracturing. Thousands of pounds of fracking chemicals are likely to be transported to these areas, injected into the ground, and either reinjected underground or transported offsite for disposal.²⁸⁰ The amount of produced water also is likely to increase with increasing rates of hydraulic fracturing.²⁸¹ Such wastewaters are highly corrosive, increasing the risk of pipelines and tanks releasing their contents.²⁸² Corrosion of pipelines and tanks is a common cause of leaks and spills.²⁸³

²⁸⁰ See EPA, "Analysis of Hydraulic Fracturing Fluid Data from the FracFocus Chemical Disclosure Registry 1.0," Webinar Presentation, March 2015, p. 14, available at http://www2.epa.gov/sites/production/files/2015-04/documents/fracfocus_public_webinars_508_0.pdf (noting that hundreds or thousands of pounds may be brought to, stored, and mixed on the well pad).

²⁸¹ Souther, Sara, et al., Biotic Impacts of Energy Development from Shale: Research Priorities and Knowledge Gaps, 12 Front Ecol Environ (6) 330 (2014) at 332 (noting 570% increase in wastewater production since 2004 from development of the Marcellus Shale).

²⁸² Petrowiki, "Corrosion Problems in Production," Oct. 29, 2014, available at http://petrowiki.org/Corrosion_problems_in_production ("The fact that most oil and gas production includes co-produced water makes corrosion a pervasive issue across the industry.")

²⁸³ Schardine, Daniel T., Detecting Corrosion in Production Tanks, Inspection Trends, p. 19-21, Summer 2008, available at <http://testex-ndt.com/technical-papers/detecting-corrosion-in-production-tanks/>; U.S. DOT, Pipeline & Hazardous Materials Safety Administration (PHMSA), Fact Sheet: Internal Corrosion, 2011, available at <https://primis.phmsa.dot.gov/comm/FactSheets/FSInternalCorrosion.htm?nocache=6923> ("Corrosion of all types is one of the leading causes of pipeline leaks and ruptures."); see also PHMSA, Fact Sheet: External Corrosion, 2011, available at <http://primis.phmsa.dot.gov/comm/FactSheets/FSExternalCorrosion.htm?nocache=7104>.

The cumulative effects of this increased risk of spills on endangered fish in the region must also be accounted for in the Service's analysis of the lease sale's effects on the endangered fish. This includes the spill effects of the lease sale in connection with non-federal well development projects in the entire watershed. With increasing oil and gas development expected to occur throughout the entire watershed (and not just the areas for lease), it is entirely foreseeable that the risk of spills in this region will only increase.

1. Spills and Leaks Are Likely to Adversely Affect the Endangered Fish.

An increased risk of spills due to the lease sale would adversely affect the endangered fish. Fracking chemicals and fracking wastewaters can be highly toxic to fish. Produced waters that fracking operations force to the surface from deep underground can contain high levels of total dissolved solids, salts, metals, and naturally occurring radioactive materials.²⁸⁴ Flowback waters (i.e., fracturing fluids that return to the surface) may also contain similar constituents along with fracturing fluid additives such as surfactants and hydrocarbons.²⁸⁵ The identity and effects of many of these additives is unknown, due to operators' claims of confidential business information. Compounds in mixtures can have synergistic or antagonistic effects, but it is impossible to know these effects without full disclosure.²⁸⁶

Nonetheless, accidental spills and intentional dumping of fracking fluids and wastewaters can cause large-scale harm to aquatic life. Numerous incidents of fracking wastewater contamination from pipelines, equipment blowouts, and truck accidents have been reported, and have resulted in kills of fish.²⁸⁷ In 2013, a company admitted to dumping wastewater from fracking operations into the Acorn Fork Creek in Kentucky, causing a massive fish kill.²⁸⁸ Among the species harmed was the blackside dace, a threatened minnow species.²⁸⁹ The lead

²⁸⁴ Brittingham, Margaret C., et al. Ecological Risks of Shale Oil and Gas Development to Wildlife, Aquatic Resources and their Habitats. *Environ. Sci. Technol.* 2014, 48, 11034-11047, p. 11039.

²⁸⁵ *Id.*

²⁸⁶ Souther 2014, p. 334.

²⁸⁷ See, e.g., Department of Environmental Protection, Commonwealth of Pennsylvania, Inspection Report, May 27, 2009, www.marcellus-shale.us/pdf/CC-Spill_DEP-Insp-Rpt.pdf (pipeline accidentally discharged an estimated 4,200 gallons of wastewater, as well as sediments and state investigation report concluded, "The creek was impacted by sediments all the way down to the lake and there was evidence of a fish kill as invertebrates and fish were observed lying dead in the creek."); Warco, Kathie, "Fracking truck runs off road; contents spill", The Observer-Reporter, October 21, 2010, available at http://www.uppermon.org/news/Other/OR-Frac_Truck_Spill-21Oct10.html (tanker truck hauling fracking liquid ran off a road and spilled almost 5,000 gallons of liquid spill, resulting in the contamination of a stream and several dead minnows); Michaels, C., J.L. Simpson, and W. Wegner. 2010. "Fractured Communities, Case studies of the Environmental Impacts of Industrial Gas Drilling," Riverkeeper, p. 6, available at www.riverkeeper.org/wp-content/uploads/2010/09/Fractured-Communities-FINAL-September-2010.pdf (blowout released nearly 1 million gallons of wastewater into nearby creeks, resulting in uncontrolled discharge of wastewater into a tributary of Little Laurel Run, a high-quality coldwater fishery); Department of Environmental Protection, Commonwealth of Pennsylvania, DEP Fines Talisman Energy USA for Bradford County Drilling Wastewater Spill, Polluting Nearby Water Resource," August 2, 2010, available at <http://www.portal.state.pa.us/portal/server.pt/community/newsroom/14287?id=13249&typeid=1> (spill of used natural gas drilling fluids in Bradford County, PA, sent 4,200-6,300 gallons of fluids into a wetland and a tributary of Webier Creek, which drains into a coldwater fishery).

²⁸⁸ Vaidyanathan, Gayathri, *Fracking Spills Cause Massive Ky. Fish Kill*, E&E News, Aug. 29, 2013.

²⁸⁹ *Id.*

author (a scientist at USGS) noted that the “study is a precautionary tale of how entire populations could be put at risk even with small-scale fluid spills,” “especially...if the species is threatened or is only found in limited areas, like the Blackside dace is in the Cumberland.”²⁹⁰

Wastewaters can have high levels of salinity, which aquatic organisms are sensitive to (including plants and invertebrate species that fish may depend on); thus, accidental releases of produced and flowback waters may have harmful effects on fish and their habitat.²⁹¹ Increased levels of total dissolved solids in surface waters are associated with higher rates of fish mortality.²⁹² Further, produced waters can contain copper, iron, lead, manganese, arsenic, cadmium, nickel, zinc, chromium, selenium, and sodium bicarbonate at levels above thresholds that are harmful to aquatic organisms, including fish.²⁹³ Fracking fluids may also contain hydrocarbons,²⁹⁴ which can cause deterioration of body tissues of aquatic organisms and reduced growth.²⁹⁵ Drilling fluids may also cause impaired immune function in fish.²⁹⁶ Other contaminant effects may include “changes in heart and respiratory rates; gill hyperplasia; enlarged liver; reduced growth; fin erosion; impaired endocrine system; a variety of biochemical, blood, and cellular changes; and behavioral responses.”²⁹⁷ As Fish and Wildlife Service has previously noted, “[d]isruption of behavioral functions can result in population declines or changes in year-class strength if enough individuals are affected.”²⁹⁸ Thus, chronic and persistent pollution from spills and leaks could result in harm to endangered fish at the population-scale.

4. Metrics

BLM should conduct a full assessment of the direct and indirect impacts of unconventional oil and gas development activities on wildlife and ecosystems through a suite of comprehensive studies on all species and ecosystems that could be affected. The studies should be particularly detailed for federally and state listed species, federal and state candidates for listing, and state species of special concern. The studies should address the following impacts: (1) habitat loss, degradation, and fragmentation, including edge effects; (2) water depletion; (3) air and water contamination; (4) introduction of invasive species; (5) climate change impacts; (6) health and behavioral effects such as increased stress and changes in life history behaviors; (7)

²⁹⁰ See US Geological Survey, “Hydraulic Fracturing Fluids Likely Harmed Threatened Kentucky Fish Species, Aug. 28, 2013, available at <http://www.usgs.gov/newsroom/article.asp?ID=3677#.VTf3oCFVhBd>.

²⁹¹ Brittingham 2014, p. 11039; Souther, p. 332 (noting small increases in salinity can harm or kill aquatic plants and invertebrates).

²⁹² Tuckwiller, Ross, Annotated Bibliography: Potential Impacts of Energy Development on Fisheries in the Rocky Mountain West Prepared for Theodore Roosevelt Conservation Partnership Fish, Wildlife, & Energy Working Group, p. 17.

²⁹³ *Id.* pp. 21-22 (extremely elevated chromium concentrations in fish exposed to produced waters), p. 23 (fish showing lesions and kidney damage after exposure to sodium bicarbonate).

²⁹⁴ EPA, State-level Summaries of FracFocus 1.0 Hydraulic Fracturing Data, p. 38 (Colorado fracking chemical disclosures showing high incidence of naphthalene and “solvent naphtha, petroleum, and heavy arom.”).

²⁹⁵ U.S. Fish and Wildlife Service, Biological Opinion for the Gasco Energy Inc. Field Development Project (Dec. 2011), p. 27; In the Matter of Changes to the Rules and Regulations of the Oil and Gas Conservation Commission of the State of Colorado, Cause No. 1R, Dkt No. 0803-RM-02, Testimony of Colorado Division of Wildlife Staff Regarding Surface Occupancy Restrictions, p. 39 (describing effects of toluene, naphthalene, and crude oil on various fish).

²⁹⁶ Tuckwiller, p. 22.

²⁹⁷ Gasco BO, p. 27.

²⁹⁸ *Id.*

changes in demographic rates such as reproductive success and survival; and (8) potential for population-level impacts such as declines and extirpations. These studies should consider these harms individually and cumulatively.

I. Unconventional Extraction Techniques and Underground Wastewater Disposal Pose Seismic Risks and Other Geological Hazards

If oil and gas development is allowed to proliferate in the areas for lease, increased unconventional oil and gas extraction and underground waste injection will increase the risk of induced seismicity. Induced seismic events could damage or destroy property and cause injuries or even death, especially in a state where earthquakes are rare and communities are typically not prepared for them. A no-fracking alternative would minimize these risks, while continued leasing and unconventional well development would increase them.

Research has shown that in regions of the central and eastern United States where unconventional oil and gas development has proliferated in recent years, earthquake activity has increased dramatically.²⁹⁹ More than 300 earthquakes with magnitude (M) ≥ 3 occurred between 2010 through 2012, compared with an average of 21 per year between 1967 and 2000.³⁰⁰ Moreover, although earthquakes with magnitude (M) ≥ 5.0 are very uncommon east of the Rocky Mountains, the number per year recorded in the midcontinent increased 11-fold between 2008 and 2011, compared to 1976 to 2007.³⁰¹ Mid-continent states experiencing elevated levels of seismic activity include Arkansas, Colorado, New Mexico, Ohio, Oklahoma, Texas, and Virginia.³⁰²

Research has linked much of the increased earthquake activity and several of the largest earthquakes in the U.S. midcontinent in recent years to the disposal of wastewater into deep injection wells, which is well-established to pose a significant seismic risk.³⁰³ Much of the fracking wastewater is a byproduct of oil and gas production and is routinely disposed of by injection into wells specifically designed and approved for this purpose. The injected fluids push stable faults past their tipping points, and thereby induce earthquakes.³⁰⁴ In 2015, a study published in *Science* found that, the unprecedented increase in earthquakes in the U.S. midcontinent began in 2009 has been caused solely by the instability caused by fluid injection wells associated with fracking waste disposal.³⁰⁵ To put an exclamation point on this finding, a 4.7 magnitude earthquake struck northern Oklahoma that was felt in 7 additional states, leading the Oklahoma Geological Survey to reiterate the connection between disposal wells and earthquakes

²⁹⁹Ellsworth, W.L. Injection-Induced Earthquakes, 341 *Science* 1225942 (2013) (“Ellsworth 2013”); Keranen, Katie et al., Potentially Induced Earthquakes in Oklahoma, USA: Links Between Wastewater Injection and the 2011 Mw5.7 Earthquake Sequence, *Geology* doi:10.1130/G34045.1 (March 26, 2013) (“Keranen 2013”).

³⁰⁰Ellsworth 2013.

³⁰¹Keranen 2013.

³⁰²Ellsworth 2013.

³⁰³*Id.*

³⁰⁴ Lamont-Doherty Earth Observatory, Columbia University. Distant Quakes Trigger Tremors at U.S. Waste-Injection Sites, Says Study. July 11, 2013. Available at: <https://www.ldeo.columbia.edu/news-events/distant-quakes-trigger-tremors-us-waste-injection-sites-says-study> .

³⁰⁵ M. Weingarten, S. Ge, J. W. Godt, B. A. Bekins, and J. L. Rubinstein. June 19, 2015. High-rate injection is associated with the increase in U.S. mid-continent seismicity. *Science*, VOL 348 ISSUE 6241, pages 1336-1340.

and to shut down the most high risk wells.³⁰⁶ Earthquakes at magnitudes (M) that are felt (M3 and M4) or destructive (M4 and M5) have been attributed to wastewater injection wells in at least five states - Arkansas, Colorado, Ohio, Oklahoma, and Texas. The largest of these was a M5.7 earthquake in Prague, Oklahoma, which was the biggest in the state's history, destroying 14 homes and injuring two people.³⁰⁷ Other large earthquakes attributed to wastewater injection include an M5.3 in Colorado,³⁰⁸ M4.9 in Texas,³⁰⁹ M4.7 in Arkansas,³¹⁰ and M3.9 in Ohio.³¹¹

The proliferation of unconventional oil and gas development, including increases in extraction and injection, may increase earthquake risk in Montana. Accordingly, an EIS must fully assess the risk of induced seismicity cause by all unconventional oil and gas extraction and injection activities, including wastewater injection wells.

The analysis should assess the following issues based on guidance from the scientific literature, the National Research Council,³¹² and the Department of Energy³¹³:

- (1) whether existing oil and gas wells and wastewater injection wells in the areas for lease have induced seismic activity, using earthquake catalogs (which provide an inventory of earthquakes of differing magnitudes) and fluid extraction and injection data collected by industry;
- (2) the region's fault environment by identifying and characterizing all faults in these areas based on sources including but not limited to the USGS Quaternary Fault and Fold database. In its analysis, BLM should assess its ability to identify all faults in these areas, including strike-slip faults and deep faults that can be difficult to detect;
- (3) the background seismicity of oil- and gas-bearing lands including the history of earthquake size and frequency, fault structure (including orientation of faults), seismicity rates, failure mechanisms, and state of stress of faults;
- (4) the geology of oil- and gas-bearing lands including pore pressure, formation permeability, and hydrological connectivity to deeper faults;

³⁰⁶ Chow, Lorraine. November 19, 2015. Strong Earthquake Rattles Oklahoma, Felt in 7 Other States. <https://ecowatch.com/2015/11/19/oklahoma-earthquake-fracking/>

³⁰⁷ Ellsworth 2013, Keranen 2013.

³⁰⁸ Rubinstein, J.L. et al., The 2001–present triggered seismicity sequence in the Raton Basin of southern Colorado/northern New Mexico, 104 Bull. Seismol. Soc'y of America 5 (2014).

³⁰⁹ Brown, W.A. et al. Abstract: Investigating the cause of the 17 May 2012 M4.8 earthquake near Timpson, East Texas, Abstract 84 Seismol. Res. Lett 374 (2013).

³¹⁰ Horton, S., Disposal of Hydrofracking Waste Fluid by Injection into Subsurface Aquifers Triggers Earthquake Swarm in Central Arkansas with Potential for Damaging Earthquake, 83 Seismol. Res. Lett. 2 (2012).

³¹¹ Kim, Won-Young, Induced Seismicity Associated with Fluid Injection into a Deep Well in Youngstown, Ohio, 118 J. of Geophys. Res.: Solid Earth 3506 (February 1, 2013).

³¹² National Research Council, *Induced Seismicity Potential in Energy Technologies*. National Academies Press (2012).

³¹³ U.S. Department of Energy, *Protocol for Addressing Induced Seismicity Associated with Enhanced Geothermal Systems*, DOE/EE-0662 (2012); U.S. Department of Energy, *Best Practices for Addressing Induced Seismicity Associated with Enhanced Geothermal Systems - Draft* (2013).

- (5) the hazards to human communities and infrastructure from induced seismic activity; and
- (6) the current state of knowledge on important questions related to the risk and hazards of induced seismicity from oil and gas development activities, including:
 - (a) how the distance from a well to a fault affects seismic risk (i.e., locating wells in close proximity to faults can increase the risk of inducing earthquakes);
 - (b) how fluid injection and extraction volumes, rates, and pressures affect seismic risk;
 - (c) how the density of wells affects seismic risk (i.e., a greater density of wells affects a greater volume of the subsurface and potentially contacts more areas of a single fault or a greater number of faults);
 - (d) the time period following the initiation of injection or extraction activities over which earthquakes can be induced (i.e., studies indicate that induced seismicity often occurs within months of initiation of extraction or injection although there are cases demonstrating multi-year delays);
 - (e) how stopping extraction or injection activities affects induced seismicity (i.e., can induced seismicity be turned off by stopping extraction and injection and over what period, since studies indicate that there are often delays—sometimes more than a year—between the termination of extraction and injection activities and the cessation of induced earthquake activity);
 - (f) the largest earthquake that could be induced by unconventional oil and gas development activities in areas for lease, including earthquakes caused by wastewater injection; and
 - (g) whether active and abandoned wells are safe from damage from earthquake activity over the short and long-term.

VII. Oil and Gas Development Poses Significant Human Health and Safety Risks.

In addition to climate change effects, oil and gas leasing and fracking entail significant public health risks that should compel BLM to consider a ban on these practices in a programmatic review and in the current leasing proposal. The EA fails to study these public health risks, precluding meaningful review of the proposed action.

Ample scientific evidence indicates that well development and well stimulation activities have been linked to an array of adverse human health effects, including carcinogenic, developmental, reproductive, and endocrine disruption effects. This is all the more alarming when considering how close wells may be developed to schools, residences, and businesses under BLM's proposed leasing decision. Just as troubling, is how much is *unknown* about the chemicals used in well stimulation activities.³¹⁴ The potential human health dangers and the

³¹⁴ See, e.g. EPA 2015 at 5-73, 10-7.

precautionary principle should further compel BLM to consider not allowing further development of oil and gas minerals in the areas for lease. In comparing the no-leasing and no-fracking alternatives to leasing and continued unconventional well development scenarios, BLM should include a health impact assessment, or equivalent, of the aggregate impact that unconventional extraction techniques, including fracking, will have on human health and nearby communities.

Due to the heavy and frequent use of chemicals, proximity to fracked wells is associated with higher rates of cancer, birth defects, poor infant health, and acute health effects for nearby residents who must endure long-term exposure:

- In one study, residents living within one-half mile of a fracked well were significantly more likely to develop cancer than those who live more than one-half mile away, with exposure to benzene being the most significant risk.³¹⁵
- Another study found that pregnant women living within 10 miles of a fracked well were more likely to bear children with congenital heart defects and possibly neural tube defects.³¹⁶ A separate study independently found the same pattern; infants born near fracked gas wells had more health problems than infants born near sites that had not yet conducted fracking.^{317, 318}
- A study analyzed Pennsylvania birth records from 2004 to 2011 to assess the health of infants born within a 2.5-kilometer radius of natural-gas fracking sites. They found that proximity to fracking increased the likelihood of low birth weight by more than half, from about 5.6 percent to more than 9 percent.³¹⁹ The chances of a low Apgar score, a summary measure of the health of newborn children, roughly doubled, to more than 5 percent.³²⁰ Another recent Pennsylvania study found a correlation between proximity to unconventional gas drilling and higher incidence of lower birth weight and small-for-gestational-age babies.³²¹
- A recent study found increased rates of cardiology-patient hospitalizations in zip codes with greater number of unconventional oil and gas wells and higher well density in

³¹⁵ McKenzie, L. et al., Human Health Risk Assessment of Air Emissions from Development of Unconventional Natural Gas Resources, 424 *Science of the Total Environment* 79 (2012) (“McKenzie 2012”).

³¹⁶ McKenzie, L. et al., Birth Outcomes and Maternal Residential Proximity to Natural Gas Development in Rural Colorado, *Advance Publication Environmental Health Perspectives* (Jan. 28, 2014), <http://dx.doi.org/10.1289/ehp.1306722> (“McKenzie 2014”).

³¹⁷ Hill, Elaine L., *Unconventional Natural Gas Development and Infant Health: Evidence from Pennsylvania*, Cornell University (2012).

³¹⁸ Whitehouse, Mark, *Study Shows Fracking is Bad for Babies*, Bloomberg View, Jan. 4, 2014, available at <http://www.bloombergvew.com/articles/2014-01-04/study-shows-fracking-is-bad-for-babies>.

³¹⁹ *Id.*, citing Janet Currie of Princeton University, Katherine Meckel of Columbia University, and John Deutch and Michael Greenstone of the Massachusetts Institute of Technology.

³²⁰ *Id.*

³²¹ Stacy, Shaina L. et al. (2015) Perinatal Outcomes and Unconventional Natural Gas Operations in Southwest Pennsylvania. *PLoS ONE* 10(6): e0126425. doi:10.1371/journal.pone.0126425, available at <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0126425>.

Pennsylvania.³²² The results suggested that if a zip code went from having zero wells to well density greater than 0.79 wells/km², the number of cardiology-patient hospitalizations per 100 people (or “cardiology inpatient prevalence rate”) in that zip code would increase by 27%. If a zip code went from having zero wells to a well density of 0.17 to 0.79 wells/km², a 14% increase in cardiology inpatient prevalence rates would be expected. Further, higher rates of neurology-patient hospitalizations were correlated with zip codes with higher well density.

- Recently published reports indicate that people living in proximity to fracked gas wells commonly report skin rashes and irritation, nausea or vomiting, headache, dizziness, eye irritation and throat irritation.³²³
- A survey found agreement among experts that a minimum setback of a quarter mile from oil and gas development is necessary to protect public health.³²⁴ Half of the experts recommended a 1 to 1 ¼ mile setback. The panel also agreed that additional protections are necessary for vulnerable populations such as children and the elderly.³²⁵
- In Texas, a jury awarded nearly \$3 million to a family who lived near a well that was hydraulically fractured.³²⁶ The family complained that they experienced migraines, rashes, dizziness, nausea and chronic nosebleeds. Medical tests showed one of the plaintiffs had more than 20 toxic chemicals in her bloodstream.³²⁷ Air samples around their home also showed the presence of BTEX — benzene, toluene, ethylbenzene and xylene — colorless but toxic chemicals typically found in petroleum products.³²⁸

Chemicals used for fracking also put nearby residents at risk of endocrine disruption effects. A study that sampled water near active wells and known spill sites in Garfield County Colorado found alarming levels of estrogenic, antiestrogenic, androgenic, and antiandrogenic activities, indicating that endocrine system disrupting chemicals (EDC) threaten to contaminate surface and groundwater sources for nearby residents.³²⁹ The study concluded:

³²² Jemielital, T. et al. Unconventional Gas and Oil Drilling Is Associated with Increased Hospital Utilization Rates. PLoS ONE 10(7): e0131093, available at <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0131093>.

³²³ Rabinowitz, P.M. et al., Proximity to Natural Gas Wells and Reported Health Status: Results of a Household Survey in Washington County, Pennsylvania. Environmental Health Perspectives Advance Publication (2014); Bamberger, Michelle and R.E. Oswald, Impacts of Gas Drilling on Human and Animal Health, 22 New Solutions 51 (2012); Steinzor, N. et al., Gas Patch Roulette: How Shale Development Risks Public Health in Pennsylvania, Earthworks Gas & Oil Accountability Project (2012).

³²⁴ Brown, David et al. The Problem of Setback Distance for Unconventional Oil & Gas Development: An analysis of expert opinions. Southwest Pennsylvania Environmental Health Project Technical Reports, Issue 2 (May 9, 2016).

³²⁵ *Id.*; see also Webb, Ellen et al. Potential hazards of air pollutant emissions from unconventional oil and natural gas operations on the respiratory health of children and infants, Review Env'tl. Health 2016, available at http://ecowatch.com/wp-content/uploads/2016/05/fracking_study.pdf (suggesting greater protection from unconventional oil and gas development necessary for children and infants).

³²⁶ *Parr v. Aruba Petroleum, Inc.*, Case No. 11-01650-E (Dallas Cty., filed Sept.13, 2013).

³²⁷ Deam, Jenny, *Jury Awards Texas family Nearly \$3 million in Fracking Case*, Los Angeles Times (Apr. 3, 2014) <http://www.latimes.com/nation/la-na-fracking-lawsuit-20140424-story.html>.

³²⁸ *Id.*

³²⁹ Kassotis, Christopher D. et al., Estrogen and Androgen Receptor Activities of Hydraulic Fracturing Chemicals

[M]ost water samples from sites with known drilling-related incidents in a drilling-dense region of Colorado exhibited more estrogenic, antiestrogenic, and/or antiandrogenic activities than the water samples collected from reference sites[,] and 12 chemicals used in drilling operations exhibited similar activities. Taken together, the following support an association between natural gas drilling operations and EDC activity in surface and ground water: [1] hormonal activities in Garfield County spill sites and the Colorado River are higher than those in reference sites in Garfield County and in Missouri, [2] selected drilling chemicals displayed activities similar to those measured in water samples collected from a drilling-dense region, [3] several of these chemicals and similar compounds were detected by other researchers at our sample collection sites, and [4] known spills of natural gas fluids occurred at these spill sites.

The study also noted a linkage between EDCs and “negative health outcomes in laboratory animals, wildlife, and humans”:

Despite an understanding of adverse health outcomes associated with exposure to EDCs, research on the potential health implications of exposure to chemicals used in hydraulic fracturing is lacking. Bamberger and Oswald (26) analyzed the health consequences associated with exposure to chemicals used in natural gas operations and found respiratory, gastrointestinal, dermatologic, neurologic, immunologic, endocrine, reproductive, and other negative health outcomes in humans, pets, livestock, and wildlife species.

Of note, site 4 in the current study was used as a small-scale ranch before the produced water spill in 2004. This use had to be discontinued because the animals no longer produced live offspring, perhaps because of the high antiestrogenic activity observed at this site. There is evidence that hydraulic fracturing fluids are associated with negative health outcomes, and there is a critical need to quickly and thoroughly evaluate the overall human and environmental health impact of this process. It should be noted that although this study focused on only estrogen and androgen receptors, there is a need for evaluation of other hormone receptor activities to provide a more complete endocrine-disrupting profile associated with natural gas drilling.³³⁰

Operational accidents also pose a significant threat to public health. For example in August 2008, Newsweek reported that an employee of an energy-services company got caught in a fracking fluid spill and was taken to the emergency room, complaining of nausea and headaches.³³¹ The fracking fluid was so toxic that it ended up harming not only the worker, but

and Surface and Ground Water in a Drilling-Dense Region. *Endocrinology*, March 2014, 155(3):897–907, pp. 905-906, available at <http://press.endocrine.org/doi/full/10.1210/en.2013-1697>.

³³⁰ *Id.*, p. 905.

³³¹ Wiserman, Hannah, Untested Waters: the Rise of Hydraulic Fracturing in Oil and Gas Production and the Need to Revisit Regulation, *Fordham Env'tl. Law Rev.* 115 (2009), 138-39.

also the emergency room nurse who treated him. Several days later, after she began vomiting and retaining fluid, her skin turned yellow and she was diagnosed with chemical poisoning.³³²

Harmful chemicals are also found in the flowback fluid after well stimulation events. Flowback fluid is a key component of oil-industry wastewater from stimulated wells. A survey of chemical analyses of flowback fluid dating back to April 2014 in California revealed that concentrations of benzene, a known carcinogen, were detected at levels over 1,500 times the federal limits for drinking water.³³³ Of the 329 available tests that measured for benzene, the chemical was detected at levels in excess of federal limits in 320 tests (97 percent).³³⁴ On average, benzene levels were around 700 times the federal limit for drinking water.³³⁵ Among other carcinogenic or otherwise dangerous chemicals found in flowback fluid from fracked wells are toluene and chromium-6.³³⁶ These hazardous substances were detected in excess of federal limits for drinking water in over one hundred tests. This dangerous fluid is commonly disposed of in injection wells, which often feed into aquifers, including some that could be used for drinking water and irrigation.

Acidizing presents similarly alarming risks to public health and safety. In acidizing operations, large volumes of hydrochloric and hydrofluoric acid are transported to the site and injected underground. These chemicals are highly dangerous due to their corrosive properties and ability to trigger tissue corrosion and damage to sensory organs through contact.

While many risks are known, much more is unknown about the hundreds of chemicals used in fracking. The identity and effects of many of these additives is unknown, due to operators' claims of confidential business information. But, as the EPA recognizes, chemical identities are "necessary to understand their chemical, physical, and toxicological properties, which determine how they might move through the environment to drinking water resources and any resulting effects."³³⁷ Compounds in mixtures can have synergistic or antagonistic effects, but again, it is impossible to know these effects without full disclosure.³³⁸ The lack of this information also precludes effective remediation: "Knowing their identities would also help inform what chemicals to test for in the event of suspected drinking water impacts and, in the case of wastewater, may help predict whether current treatment systems are effective at removing them."³³⁹

³³² *Id.*

³³³ California Department of Conservation Division of Oil, Gas, & Geothermal Resources, California Well Stimulation Public Disclosure Report, *available at* <http://www.conservation.ca.gov/dog/Pages/WellStimulationTreatmentDisclosure.aspx>. The highest concentration was 7,700 parts per billion (ppb) for a well with API number 03052587. The US EPA's maximum contaminant level for benzene is 5 ppb.

³³⁴ *Id.*

³³⁵ *Id.*, see also Cart, J., High Levels of Benzene Found in Fracking Wastewater, Los Angeles Times, Feb. 11, 2015, <http://www.latimes.com/local/california/la-me-fracking-20150211-story.html#page=1>.

³³⁶ *Id.*; see also Center for Biological Diversity, Cancer-causing Chemicals Found in Fracking Flowback from California Oil Wells (2015) Feb. 11, 2015, *available at* http://www.biologicaldiversity.org/news/press_releases/2015/fracking-02-11-2015.html.

³³⁷ EPA 2015 at 10-18.

³³⁸ Souther, Sara et al. Biotic Impacts of Energy Development from Shale: Research Priorities and Knowledge Gaps, *Front Ecol Environ* 2014; 12(6): p. 334.

³³⁹ EPA 2015 at 10-18.

Even where chemical identities are known, chemical safety data may be limited. In EPA's study of the hazards of fracking chemicals to drinking water, EPA found that "[o]ral reference values and oral slope factors meeting the criteria used in this assessment were not available for the majority of chemicals used in hydraulic fracturing fluids [87%], representing a significant data gap for hazard identification."³⁴⁰ Without this data, EPA could not adequately assess potential impacts on drinking water resources and human health.³⁴¹ Further, of 1,076 hydraulic fracturing fluid chemicals identified by the EPA, 623 did not have estimated physiochemical properties reported in EPA's toxics database, although this information is "essential to predicting how and where it will travel in the environment."³⁴² The data gaps are actually much larger, because EPA excluded 35% of fracking chemicals reported to FracFocus from its analysis because it could not assign them standardized chemical names.³⁴³

The EA fails to incorporate a literature review of the harmful effects of each of the chemicals known to be used in fracking and other unconventional oil and gas extraction methods. Without knowing the effects of each chemical, the EA cannot accurately project the true impact of unconventional oil and gas extraction.

The EA also fails to study the human health and safety impacts of noise pollution, light pollution, and traffic accidents resulting from oil and gas development. A recent study found that automobile and truck accident rates in counties in Pennsylvania with heavy unconventional oil and gas extraction activity were between 15 and 65 percent higher than accident rates in counties without unconventional oil and gas extraction activities.³⁴⁴ Rates of traffic fatalities and major injuries may be higher in areas with heavy drilling activity than areas without.³⁴⁵

VIII. Fossil Fuel Development Will Impact Land Use

Increased oil and gas extraction and production have the potential to dramatically and permanently change the landscape of the areas for lease and their surroundings. Countless acres of land will likely be leveled to allow for the construction and operation of well pads and related facilities such as wastewater pits. Roads may have to be constructed or expanded to accommodate trucks transporting chemicals and the large quantities of water needed for some recovery methods. Transmission lines and other utilities may also be required. The need for new distribution, refining, or waste treatment facilities will expand industrial land use. With new roads and other industrial infrastructure, certain areas could open up to new industrial or extractive activities, permanently changing the character and use of the land.

Such changes would result in a significant cumulative losses of agricultural and conservation lands. Vegetation removal by oil and gas development across central North America between 2000 and 2012 is estimated to be 4.5 tetragrams of carbon or 10 tetragrams of

³⁴⁰ *Id.* at 10-7, 9-7.

³⁴¹ *Id.* at 9-37-38.

³⁴² *Id.* at 5-73.

³⁴³ *Id.* at 9-38.

³⁴⁴ Graham, J., Irving et al., Increased Traffic Accident Rates Associated with Shale Gas Drilling in Pennsylvania. 74 Accident Analysis and Prevention 203 (2015).

³⁴⁵ *Id.*

dry biomass.³⁴⁶ This is equivalent to more than half of annual available grazing on public lands managed by BLM or 6% of the wheat produced in 2013 within the region (120.2 million bushels of wheat).³⁴⁷ This loss of “net primary production” (amount of carbon fixed by plants and accumulated as biomass) is “likely long-lasting and potentially permanent, as recovery or reclamation of previously drilled land has not kept pace with accelerated drilling.”³⁴⁸ The total surface disturbance by oil and gas development within this time period is 3 million hectares, the equivalent of three Yellowstone National Parks.³⁴⁹ As noted above, the fragmented nature of this surface disturbance negatively impacts wildlife by severing migratory pathways, altering wildlife behavior and mortality, and increasing susceptibility to ecologically disruptive species.³⁵⁰

The conversion of substantial acreages from rural or natural landscapes to industrial sites will also mar scenic views throughout the planning area. Given BLM’s failure to ensure full reclamation of idle wells and the difficulty of restoring sites to their original condition, scenic resources may be permanently impaired.

IX. BLM Must Prepare an Environmental Impact Statement

NEPA demands that a federal agency prepare an EIS before taking a “major [f]ederal action[] significantly affecting the quality’ of the environment.” *Kern v. U.S. Bureau of Land Mgmt.*, 284 F.3d 1062, 1067 (9th Cir. 2002). In order to determine whether a project’s impacts may be “significant,” an agency may first prepare an Environmental Assessment (“EA”). 40 C.F.R. §§ 1501.4, 1508.9. If the EA reveals that “the agency’s action may have a significant effect upon the . . . environment, an EIS must be prepared.” *Nat’l Parks & Conservation Ass’n v. Babbitt*, 241 F.3d 722, 730 (9th Cir. 2001) (internal quotations omitted). If the agency determines that no significant impacts are possible, it must still adequately explain its decision by supplying a “convincing statement of reasons” why the action’s effects are insignificant. *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1212 (9th Cir. 1998). Further, an agency must prepare all environmental analyses required by NEPA at “the earliest possible time.” 40 C.F.R. § 1501.2. “NEPA is not designed to postpone analysis of an environmental consequence to the last possible moment,” but is “designed to require such analysis as soon as it can reasonably be done.” *Kern*, 284 F.3d at 1072.

BLM is therefore required under NEPA to prepare an EIS to support this proposed project. This is especially true in light of the likelihood that fracking would occur on the leases. *CBD*, 937 F. Supp. 2d at 1155-59 (holding that oil and gas leases were issued in violation of NEPA where BLM failed to prepare an EIS and failed to properly address the significance factors for context and intensity in 40 C.F.R. § 1508.27).

In considering whether the lease sale would have significant effects on the environment, NEPA’s regulations require BLM to evaluate ten factors regarding the “intensity” of the impacts.

³⁴⁶ Allred, Brady et al. Ecosystem services lost to oil and gas in North America: Net primary production reduced in crop and rangelands. *Science*, vol. 384, issue 6233 (April 24, 2015) at 401.

³⁴⁷ *Id.*

³⁴⁸ *Id.*

³⁴⁹ *Id.* at 402.

³⁵⁰ *Id.*

40 C.F.R. § 1508.27(b). The Ninth Circuit has held that the existence of any “one of these factors may be sufficient to require preparation of an EIS.” *Ocean Advocates*, 402 F.3d at 865; *Nat’l Parks & Conservation Ass’n*, 241 F.3d at 731. Several of these “significance factors” are implicated in the lease sale and clearly warrant the preparation of an EIS:

The degree to which the effects on the quality of the human environment are likely to be highly controversial.

The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

The degree to which the proposed action affects public health or safety.

The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

40 C.F.R. § 1508.27(b)(4), (5), (2) & (9). *See CBD*, 937 F. Supp. 2d at 1158-59 (holding that BLM failed to properly address the significance factors regarding controversy and uncertainty that may have been resolved by further data collection (citing *Native Ecosystems Council v. U.S. Forest Serv.*, 428 F.3d 1233, 1240 (9th Cir. 2005))). Here, individually and considered as a whole, there is no doubt that significant effects may result from the lease sale; thus, NEPA requires that BLM should have prepared an EIS for the action.

i. The effects on the human environment will be highly controversial

A proposal is highly controversial when “substantial questions are raised as to whether a project . . . may cause significant degradation” of a resource, *Nw. Envtl. Def. Ctr. v. Bonneville Power Admin.*, 117 F.3d 1520, 1536 (9th Cir. 1997), or when there is a “substantial dispute [about] the size, nature, or effect of the” action. *Blue Mtns. Biodiversity*, 161 F.3d at 1212. A “substantial dispute exists when evidence, raised prior to the preparation of [a] . . . FONSI, casts serious doubt upon the reasonableness of an agency’s conclusions.” *Nat’l Parks & Conserv. Ass’n*, 241 F.3d at 736. When such a doubt is raised, “NEPA then places the burden on the agency to come forward with a ‘well-reasoned explanation’ demonstrating why those responses disputing the EA’s conclusions ‘do not . . . create a public controversy.’” *Id.* *See also CBD*, 937 F. Supp. 2d at 1158 .

Here, the controversy regarding the lease sale is fully evident. This comment letter provides abundant evidence that oil and gas operations can cause significant impacts to human health, water resources, air quality, imperiled species, and seismicity. The potential for these significant impacts to occur is particularly clear in light of the potential for fracking to result from the lease sale.

Fracking is among the top, if not the most controversial energy issue facing America today. The controversy spans the public arena, scientific discourse, local governments, and the halls of Congress. At the request of Congress, EPA is conducting a study into the effects of

fracking on drinking and ground water.³⁵¹ Similarly, the New York DEC concluded that the health and environmental risks from fracking supports its ban in New York State. However, in addition to the presence of controversy, it is already evident, as discussed above, that fracking is harmful. Clearly, the level of controversy associated with fracking and its expansion in Wyoming in association with the lease sale is sufficient to trigger the need for an EIS. 40 C.F.R. § 1508.27(b)(4).

ii. The lease sale presents highly uncertain or unknown risks

An EIS must also be prepared when an action's effects are "highly uncertain or involve unique or unknown risks." 40 C.F.R. § 1508.27(b)(5). As the Ninth Circuit has held, "[p]reparation of an EIS is mandated where uncertainty may be resolved by further collection of data, or where the collection of such data may prevent speculation on potential . . . effects." *Native Ecosystems Council v. U.S. Forest Serv.*, 428 F.3d 1233, 1240 (9th Cir. 2005) (internal citations omitted); *Blue Mtns. Biodiversity*, 161 F.3d at 1213-1214 (finding "EA's cursory and inconsistent treatment of sedimentation issues . . . raises substantial questions about . . . the unknown risks to" fish populations). As one court recently explained regarding oil and gas leasing that may facilitate fracking, "BLM erroneously discounted the uncertainty from fracking that may be resolved by further data collection. 'Preparation [of an EIS] is mandated where uncertainty may be resolved by further collection of data, or where collection of such data may prevent speculation on potential effects.'" *CBD*, 937 F. Supp. 2d at 1159 (quoting *Native Ecosystems Council v. U.S. Forest Serv.*, 428 F.3d 1233, 1240 (9th Cir. 2005)).

While it is clear that oil and gas activities can cause great harm, there remains much to be learned about the specific pathways through which harm may occur and the potential degree of harm that may result. Additional information is needed, for example, about possible rates of natural gas leakage, the potential for fluids to migrate through the ground in and around the parcels, the safety of various fracking chemicals, and the potential for drilling to affect local faults. NEPA clearly dictates that the way to address such uncertainties is through the preparation of an EIS.

iii. The lease sale poses threats to public health and safety

As discussed in great detail above, the oil and gas activities that may occur as a result of the lease sale could cause significant impacts to public health and safety. 40 C.F.R. § 1508.27(b)(2). Fracking would pose a grave threat to the region's water resources, harm air quality, pose seismic risks, negatively affect wildlife, and fuel climate change.

As a congressional report noted, oil and gas companies have used fracking products containing at least 29 products that are known as possible carcinogens, regulated for their human health risk, or listed as hazardous air pollutants.³⁵² The public's exposure to these harmful pollutants alone would plainly constitute a significant impact. So do the many other public health

³⁵¹ U.S. Environmental Protection Agency, Plan to Study the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources (November 2011).

³⁵² Waxman, Henry et al., United States House of Representatives, Committee on Energy and Commerce, Minority Staff, Chemicals Used in Hydraulic Fracturing (Apr. 2011) ("Waxman 2011")

risks associated with unconventional drilling as described above in section VII. Furthermore, and as previously discussed, information continues to emerge on the risk of earthquakes induced by wastewater injected into areas near faults. It is undeniable that these earthquakes pose risks to the residents of the area and points beyond

The use of fracking fluid, which is likely to occur as a result of the lease sale, and other risks associated with unconventional drilling, pose a major threat to public health and safety and therefore constitute a significant impact. BLM therefore must evaluate such impacts in an EIS.

iv. The Lease Sale Action Will Adversely Affect Candidate and Agency Sensitive Species and Their Habitat

An EIS may also be required when an action “may adversely affect an endangered or threatened species or its habitat.” 40 C.F.R. § 1508.27(b)(9). Although a finding that a project has “some negative effects does not mandate a finding of significant impact,” an agency must nonetheless fully and closely evaluate the effects on listed species and issue an EIS if those impacts are significant. *Klamath-Siskiyou Wildlands Ctr. v. U.S. Forest Serv.*, 373 F. Supp. 2d 1069, 1081 (E.D. Cal. 2004) (finding agency’s conclusion that action “may affect, is likely to adversely affect” species due to “disturbance and disruption of breeding” and “degradation” of habitat is “[a]t a minimum, . . . an important factor supporting the need for an EIS”).

X. BLM Must Ensure That the Federal Land Policy and Management Act and the Mineral Leasing Act Are Not Violated

The Mineral Leasing Act (“MLA”) requires BLM to demand lessees take all reasonable measures to prevent the waste of natural gas. The MLA states:

All leases of lands containing oil or gas, made or issued under the provisions of this chapter, shall be subject to the condition that the lessee will, in conducting his explorations and mining operations, use all reasonable precautions to prevent waste of oil or gas developed in the land, or the entrance of water through wells drilled by him to the oil sands or oil-bearing strata, to the destruction or injury of the oil deposits.

30 U.S.C. § 225; *see also id.* § 187 (stating that for the assignment or subletting of leases that “[e]ach lease shall contain . . . a provision . . . for the prevention of undue waste”). This statutory mandate is unambiguous and must be enforced. *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 184 n.29 (1978) (stating that “[w]hen confronted with a statute which is plain and unambiguous on its face,” “it is not necessary to look beyond the words of the statute.”). As already discussed in previous sections, oil and gas operations emit significant amounts of natural gases, including methane and carbon dioxide, which can be easily prevented.³⁵³

³⁵³ *See* U.S. Government Accountability Office, Federal Oil and Gas Leases, Opportunities Exist to Capture Vented and Flared Natural Gas, Which Would Increase Royalty Payments and Reduce Greenhouse Gases 20 (2010)

Pursuant to the Federal Land Policy and Management Act (“FLPMA”), BLM must “take any action necessary to prevent unnecessary or undue degradation of the [public] lands.” 43 U.S.C. § 1732(b). Written in the disjunctive, BLM must prevent degradation that is “unnecessary” and degradation that is “undue.” *Mineral Policy Ctr. v. Norton*, 292 F.Supp.2d 30, 41-43 (D. D.C. 2003). The protective mandate applies to BLM’s leasing decisions. *See Utah Shared Access Alliance v. Carpenter*, 463 F.3d 1125, 1136 (10th Cir. 2006) (finding that BLM’s authority to prevent degradation is not limited to the RMP planning process). Greenhouse gas pollution for example causes “undue” degradation. Even if the activity causing the degradation may be “necessary,” where greenhouse gas pollution is avoidable, it is still “unnecessary” degradation. 43 U.S.C. § 1732(b).

In addition to being harmful to human health and the environment, the emissions from oil and gas operations are also an undue and unnecessary waste and degradation of public lands. Consequently, BLM’s proposed gas and oil lease sale violates FLPMA. *See* 43 U.S.C. § 1732(b).

Conclusion

Oil and gas leasing is an irrevocable commitment to convey rights to use of federal land – a commitment with readily predictable environmental consequences that BLM is required to address. These include the specific geological formations, surface and ground water resources, seismic potential, or human, animal, and plant health and safety concerns present in the area to be leased. Unconventional oil and gas development not only fuel the climate crisis but entail significant public health risks and harms to the environment. Accordingly, BLM should end all new leasing on BLM lands. Should BLM proceed with the lease sale it must thoroughly analyze the alternatives of no new leasing (or no action), and no fracking or other unconventional well stimulation methods in an EIS.

Thank you for your consideration of these comments. The Center for Biological Diversity and the Montana Chapter of the Sierra Club look forward to reviewing a legally adequate EIS for this proposed oil and gas leasing action.

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From: Kyle Tisdel
To: mames@blm.gov; nmleasesalecomments@blm.gov
Subject: Scoping Comments_Farmington January 2017 Lease Sale
Date: Friday, June 17, 2016 6:32:31 PM
Attachments: [FFO Jan 2017 Lease Scoping.pdf](#)

Dear Mr. Ames:

Please find the attached scoping comments for the January 2017 oil and gas lease sale, submitted on behalf of San Juan Citizens Alliance, Diné Citizens Against Ruining Our Environment, WildEarth Guardians, Natural Resources Defense Council, Amigos Bravos, Chaco Alliance, and Sierra Club. Should you have any questions please do not hesitate to contact me.

Regards,

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Defending the West www.westernlaw.org

Western Environmental Law Center

June 17, 2016

Sent via Electronic Mail

U.S. Bureau of Land Management
Farmington Field Office
Attn: Mark Ames
6251 College Blvd., Suite A
Farmington, New Mexico 87402
Email: names@blm.gov
Email: NMLEasesalecomments@blm.gov

Re: Scoping Comments – Farmington Field Office, January 2017 Oil & Gas Lease Sale

Dear Mr. Ames:

The Western Environmental Law Center, along with San Juan Citizens Alliance, Diné Citizens Against Ruining Our Environment, WildEarth Guardians, Natural Resources Defense Council, Amigos Bravos, Chaco Alliance, and Sierra Club (together “Citizens Groups”), submit the following Scoping Comments regarding the Bureau of Land Management (“BLM”) Farmington Field Office (“FFO”) January 2017 Oil and Gas Lease Sale, including four parcels and approximately 843 acres of Federal mineral estate in the Greater Chaco area, south of Counselor, NM.

These four parcels all involve Navajo Allotment lands, with a federal mineral estate administered by the FFO. These and similar parcels have already been deferred or postponed *three times* by the agency, having recognized the need for additional consultation and baseline landscape level review. These parcels were first included in the original group of 26 parcels proposed for BLM’s October 2014 oil and gas lease sale, DOI-BLM-NM-F010-0154-EA, and were then amongst the five parcels included in the January 2015 lease sale, DOI-BLM-NM-F010-2014-0227-EA. Most recently, three parcels were included in the October 2016 lease sale, which was postponed earlier this month. Notably, these parcels were “deferred until after the FFO Mancos Shale/Gallup Formation RMPA/EIS alternatives have been developed.” Oct. 2014 Lease Sale EA at 14. Then, with the January 2015 lease sale, the parcels were deferred because “additional time is required to evaluate public comments regarding potential drainage, tribal consultation, and environmental justice.” BLM Press Release, December 30, 2014. While the Mancos RMPA remains incomplete and alternatives are still being developed, no formal tribal consultation has occurred, and environmental justice issues remain ever present, remarkably, the

FFO has chosen to move forward with the sale of Navajo allotment parcels in the Greater Chaco region *for a fourth time*.

Accordingly, Citizens Groups hereby incorporate by reference our prior administrative comments, protests, and exhibits submitted for these prior lease sales, including October 2014 Scoping Comments (March 24, 2014), Draft Environmental Assessment Comments (May 28, 2014), and Protest (August 14, 2014), January 2015 Draft Environmental Assessment Comments (September 23, 2014) and Protest (November 19, 2014), as well as our October 2016 Scoping Comments (March 14, 2016). Because the four parcels at issue here have previously been offered and deferred and/or postponed by the FFO, all prior administrative engagement is properly before the agency and should be considered and included in the administrative record for this lease sale. These incorporated comments and exhibits offer detailed technical information, expert reports, and legal analysis that the agency is required to consider in its decisionmaking process for the proposed action. *See Forest Guardians v. U.S. Fish and Wildlife Service*, 611 F.3d 692, 717 (10th Cir. 2010) (“The purpose behind NEPA is to ensure that the agency will only reach a decision on a proposed action after carefully considering the environmental impacts of several alternative courses of action and *after taking public comment into account*.”).

Because the Mancos RMPA remains incomplete, the applicable land use plan for this action is the 2003 Farmington RMP, with “the analysis of projected surface disturbance impacts ... based on well densities listed in the Reasonable Foreseeable Development (“RFD”) Scenario included in the 2003 Farmington RMP.” However, as will be explained in further detail, reliance on the 2003 RMP and RFD fails to demonstrate that impacts associated with the proposed leasing will not be significant, or that leasing will otherwise sufficiently protect resources in the FFO. This is due to the fact that, by the BLM’s own admission, the RMP and RFD do not account for the environmental impacts of horizontal drilling and multi-stage fracturing of the Mancos Shale formation. Yet by leasing these parcels, the BLM is poised to facilitate just this kind of unforeseen development, despite any analysis as to the actual environmental impacts on both project and programmatic level.

The **Western Environmental Law Center** (“WELC”) uses the power of the law to defend and protect the American West’s treasured landscapes, iconic wildlife and rural communities. WELC combines legal skills with sound conservation biology and environmental science to address major environmental issues in the West in the most strategic and effective manner. WELC works at the national, regional, state, and local levels; and in all three branches of government. WELC integrates national policies and regional perspective with the local knowledge of our 100+ partner groups to implement smart and appropriate place-based actions.

Founded in 1986, **San Juan Citizens Alliance** (“SJCA”) organizes people to protect our water and air, our lands, and the character of our rural communities in the San Juan Basin. SJCA focuses on four program areas, including the *San Juan Basin Energy Reform Campaign*, which ensures proper regulation and enforcement of the oil, gas, and coal industry and transitioning to a renewable energy economy. SJCA has been active in BLM and National Forest oil and gas issues in the San Juan Basin since the early 1990s, and has commented on virtually every multi-well drilling program, lease sale, and programmatic environmental review conducted in the region by the federal land management agencies since the early 1990s. SJCA’s members live, work, and

recreate throughout the San Juan Basin and San Juan Mountains. SJCA's members' health, use and enjoyment of this region is directly impacted by the decisions identified in this protest.

Diné Citizens Against Ruining Our Environment ("Diné C.A.R.E.") is an all-Navajo organization comprised of a federation of grassroots community activists in Arizona, New Mexico and Utah who strive to educate and advocate for our traditional teachings derived from our Diné Fundamental Laws. Our goal is to protect all life in our ancestral homeland by empowering local and traditional people to organize, speak out, and determine the outlook of the environment through civic involvement and engagement in decision-making process relating to tribal development.

WildEarth Guardians protects and restores wildlife, wild places, wild rivers, and the health of the American West. As part of its Climate and Energy Program, Guardians works to advance clean energy and expose the true cost of fossil fuels. Guardians works to protect and restore the San Juan Basin in northwestern New Mexico in order to safeguard its cultural heritage, natural values, communities, and open spaces.

The **Natural Resources Defense Council** ("NRDC") is a non-profit environmental membership organization with more than 440,000 members throughout the United States. Approximately 5,000 of these members reside in New Mexico. NRDC members use and enjoy public lands in New Mexico, including lands managed by the Bureau of Land Management within the Farmington Field Office planning area. NRDC members use and enjoy these lands for a variety of purposes, including: recreation, solitude, scientific study, and conservation of natural resources. NRDC has had a longstanding and active interest in the protection of public lands in New Mexico, the responsible development of oil and gas resources, and the protection of public health from environmental threats.

Amigos Bravos is a statewide river conservation organization guided by social justice principles. Amigos Bravos' mission is to protect and restore the waters of New Mexico, and ensure that those waters provide a reliable source of clean water to the communities and farmers that depend on them, as well as a safe place to swim, fish, and go boating. Amigos Bravos works locally, statewide, and nationally to ensure that the waters of New Mexico are protected by the best policy and regulations possible.

The **Chaco Alliance** is a grassroots citizens group dedicated to protecting and preserving Chaco Culture National Historical Park. We are interested in all threats to the park and its surrounding landscape, especially the threat created by energy development in the area.

Earthworks is a nonprofit organization dedicated to protecting communities and the environment from the adverse impacts of mineral and energy development while promoting sustainable solutions. Earthworks stands for clean air, water and land, healthy communities, and corporate accountability. We work for solutions that protect both the Earth's resources and our communities.

The **Sierra Club** was founded in 1892 and is the nation's oldest grassroots environmental organization. The Sierra Club is incorporated in California, and has

approximately 600,000 members nationwide and is dedicated to the protection and preservation of the environment. The Sierra Club's mission is to explore, enjoy and protect the wild places of the earth; to practice and promote the responsible use of the earth's ecosystems and resources; and to educate and enlist humanity to protect and restore the quality of the natural and human environments. The Sierra Club has a New Mexico chapter, known as the Rio Grande chapter, with members that live in and use this area for recreation such as hiking, climbing, backpacking, camping, fishing and wildlife viewing, as well as for business, scientific, spiritual, aesthetic and environmental purposes.

I. The BLM is Required to Issue a Moratorium on All Oil and Gas Leasing and Development Decisionmaking so long as the Mancos Shale/Gallup Formation RMP and EIS Remains Uncompleted.

Where, as here, there is a pending revision to the Resource Management Plan Amendment ("RMPA") and environmental impact statement ("EIS") for the Mancos Shale/Gallup Formation (hereinafter "Mancos RMPA") – updating the out-of-date reasonable foreseeable development ("RFD") scenario for the planning area – NEPA establishes a duty "to stop actions that adversely impact the environment, that limit the choice of alternatives for the EIS, or that constitute an 'irreversible and irretrievable commitment of resources.'" *Conner v. Burford*, 848 F.2d 1441, 1446 (9th Cir. 1988). When an EIS is underway, as here, NEPA regulations established by the Council of Environmental Quality ("CEQ") prohibit an agency from taking any actions that would significantly impact the environment. 40 C.F.R. § 1506.1(c) (1997). Pursuant to these CEQ regulations:

While work on a required program environmental impact statement is in progress and the action is not covered by an existing program statement, agencies shall not undertake in the interim any major Federal action covered by the program which may significantly affect the quality of the human environment unless such action:

- (1) Is justified independently of the program;
- (2) Is itself accompanied by an adequate environmental impact statement;
- and
- (3) Will not prejudice the ultimate decision on the program. Interim action prejudices the ultimate decision on the program when it tends to determine subsequent development or limit alternatives.

40 C.F.R. §§ 1506.1(c)(1)-(3).

Proceeding with the January 2017 Lease Sale – or any other major Federal action impacting resources in the planning area – is impermissible due to the inherent prejudice that this action will cause to the pending Mancos RMPA. Revision of the RFD for the planning area is fundamental to the public land use decisionmaking process in the FFO and beyond – creating the foundation upon which all mineral resource management decisions are made – and, as explained by the agency's Federal Register Notice, the FFO's 2003 RMP/EIS is incapable of performing this function.

As full-field development occurs, especially in the shale oil play, additional impacts may occur that previously were not anticipated in the RFD or analyzed in the current 2003 RMP/EIS, which will require an EIS-level plan amendment and revision of the RFD for complete analysis of the Mancos Shale/Gallup Formation.

79 Fed. Reg. 10548 (Feb. 25, 2014).

The whole point of NEPA is to study the impact of an action on the environment before the action is taken. *See Conner*, 848 F.2d at 1452 (NEPA requires that agencies prepare an EIS before there is “any irreversible and irretrievable commitment of resources”). Where “[i]nterim action prejudices the ultimate decision on the program,” NEPA forbids it. 40 C.F.R. §§ 1506.1(c)(1)-(3). Action prejudices the outcome “when it tends to determine subsequent development or limit alternatives.” *Id.* In this case, once oil and gas lease rights are conveyed, lessees have a right to drill, and the impact on the environment from the exercise of those rights cannot be undone, which is exactly the situation NEPA disallows – allowing new activity that limits alternatives in the future.

As provided, while CEQ regulations require a moratorium on any further leasing until the Mancos Shale RMP and EIS are completed, such a decision is also well within the discretion of the FFO. As provided in BLM Instruction Memorandum No. 2010-117 (May 17, 2010):

As outlined in the Land Use Planning Handbook (H-1601-1), the Resource Management Plan (RMP) underlies fluid minerals leasing decisions. Through RMP effectiveness monitoring and periodic RMP evaluations, state and field offices will examine resource management decisions to determine whether the RMPs adequately protect important resource values in light of changing circumstances, updated policies, and new information (H-1601-1, section V, A, B). The results of such reviews and evaluations may require field office resource information updates and land use plan maintenance, amendment, or revision. In some cases state and field office staff may determine that the public interest would be better served by further analysis and planning prior to making any decision whether or not to lease.

(emphasis added). Here, the public interest would be better served by completing the RMPA and EIS *before* deciding whether it is appropriate to lease additional public lands. According to BLM oil and gas statistics, there are currently 5,027,750 acres of leased land that is “in effect” in New Mexico; but only approximately 70% of which is in production. *See* BLM, Oil and Gas Statistics by Year for Fiscal Years 1988 – 2012. Before additional public lands are sold to oil and gas industry speculators, the agency must understand the additional impacts of developing the Mancos Shale/Gallup formation.

Critically, BLM’s Taos Field Office recently deferred 16 parcels and 13,300 acres of public lands in the same Mancos Shale formation, and these four parcels were deferred and/or postponed three times by the FFO. At least in part due to the FFO’s pending RMPA, which, “[o]nce completed, the information provided by this study will help to BLM to make future

decisions regarding leasing in this area[,]” the Taos Field Office decided to defer the sale.¹ The FFO took a similar approach with the October 2014 lease sale, where these parcels were “deferred until after the FFO Mancos Shale/Gallup Formation RMPA/EIS alternatives have been developed.” Oct. 2014 Lease Sale EA at 14.

This type of reasoned approach should remain with the four parcels included in the January 2017 lease sale. Such an approach is not only commonsense, but, as discussed above, is also required given the resulting prejudice to the Mancos Shale RMPA and EIS that *any* sale and subsequent development would create. Under these circumstances, NEPA plainly prohibits undertaking any action that would limit alternatives, as proceeding in the sale of these four parcels certainly would. 40 C.F.R. §§ 1506.1(c)(1)-(3).

II. BLM Should Use Its Broad Discretion Not to Lease the Proposed Parcels.

The BLM FFO has broad discretion and remove the four parcels from nomination. Given the proximity of these parcels to already deferred areas – which are not divided by geography as much as they are by field office boundaries – deferral is the only reasonable option. As was true with the Taos Field Office parcels, the agency’s chosen path of opening this area up to oil and gas development would threaten the water resources serving both the communities and the surrounding area – which is particularly true given the unique geology underlying the planning area. Quite simply, developing this area for oil and gas represents an unnecessary and avoidable risk that would threaten the area’s other important multiple use resources.

BLM has broad discretion – and often the responsibility, though too often ignored – not to lease public lands for minerals development to safeguard other multiple use, environmental, and human health resources and values. *See, e.g., Udall v. Tallman*, 380 U.S. 1 (1965); *Rocky Mountain Oil & Gas Association v. U.S. Forest Service*, 157 F.Supp.2d 1142 (D. Mont. 2000). BLM’s authority to open these four parcels to oil and gas development is derived from the Mineral Leasing Act of 1920, 30 U.S.C. § 181 *et seq.* Nowhere does the Mineral Leasing Act (“MLA”) mandate that any particular lands be offered for lease. Rather, the Act states generally that “[a]ll lands subject to disposition under this chapter which are known or believed to contain oil or gas deposits *may* be leased by the Secretary.” 30 U.S.C. § 226(a) (emphasis added). The Ninth Circuit has held that the “permissive word ‘may’ in § 226(a) allows the Secretary to lease such lands, but does not require him to do so. . . . [T]he Secretary has discretion to refuse to issue any lease at all on a given tract.” *Burglin v. Morton*, 527 F.2d 486, 488 (9th Cir. 1975). The Supreme Court reached the same conclusion in *Udall v. Tallman*, 380 U.S. 1, 4 (1965), in which the Court declared that the Mineral Leasing Act “left the Secretary discretion to refuse to issue any lease at all on a given tract.” *See also Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1230 (9th Cir. 1988) (providing that refusal to issue leases constitutes a “legitimate exercise of the discretion granted to the Interior Secretary”); *McDonald v. Clark*, 771 F.2d 460, 463 (10th Cir. 1985) (“While the statute gives the Secretary the authority to lease government lands under oil and gas leases, this power is discretionary rather than mandatory.”); *McTiernan v. Franklin*, 508 F. 2d 885, 887 (10th Cir. 1975) (under § 226(a), the government “may refuse to issue any lease at

¹ *See* BLM, Taos Field Office, *October 2014 Oil and Gas Lease Sale*, available at: http://www.blm.gov/nm/st/en/fo/Taos_Field_Office/tafo_og_sale_october.html.

all on a given tract”); *Pease v. Udall*, 332 F.2d 62, 63 (9th Cir. 1964) (Mineral Leasing Act “has consistently been construed as leaving to the Secretary, within his discretion, a determination as to what lands are to be leased thereunder”); *Pacific Legal Foundation v. Watt*, 529 F.Supp. 982, 991 n.14 (D. Mont. 1982) (under § 226(a), “the Secretary has discretion either to issue or refuse to issue oil and gas leases”).

Indeed, BLM’s discretion over oil and gas leasing is so great that courts have held that the agency may decide not to allow leasing even after the lands have been offered for lease and a qualified applicant selected. In *McDonald*, the Tenth Circuit Court of Appeals provided: “The fact that land has been offered for lease does not bind the Secretary to actually lease the land, nor is the Secretary bound to lease the land when a qualified applicant has been selected.” *McDonald*, 771 F.2d at 463. The Court continued, saying “the Secretary may withdraw land from leasing at any time before the actual issuance of the lease, even if the offer was filed long before the determination not to lease was made.” *Id.* (citing *Arnold v. Morton*, 529 F.2d 1101, 1106 (9th Cir. 1976); *Schraier v. Hickel*, 419 F.2d 663, 665-67 (D.C. Cir. 1969)).

Moreover, nothing in the Federal Onshore Oil and Gas Leasing Reform Act (“FOOGLRA”) requires BLM to open lands at the behest of the oil and gas industry. The MLA, as amended by FOOGLRA in 1987, 30 U.S.C. § 181 *et seq.*, simply requires BLM to *consider* oil and gas leasing on land consistent with the RMP. As identified above, just because land is identified for leasing does not mean that it must be leased. If review of a potential lease proposed for sale reveals problems, or that other resources and values should be protected, the agency can decide not to lease, period, and in fact, may be duty-bound, pursuant to laws such as FLPMA, not to lease to ensure that other resources and values are protected. For example, in *Marathon Oil Co.*, 139 IBLA 347 (1997), BLM removed parcels from a competitive lease sale for environmental reasons, even after they had been offered for sale pursuant to industry nomination. In that case, the IBLA held that “BLM enjoys considerable discretion to depart from its RMP in any specific case, and it may well be able to justify excluding these parcels from leasing for environmental purposes.” *Id.* at 356.

The MLA and FOOGLRA do not in any way restrict the factors that BLM may consider when exercising its considerable discretion under § 226(a). Therefore, even if the BLM bases its decision entirely on the public’s overwhelming opposition to oil and gas development in this area, it has the authority to do so. Indeed, it would be irresponsible for BLM’s FFO to propose these four lease parcels for sale without first performing the necessary due diligence and environmental review to determine, on a site-specific basis, whether these lands should be conserved as is.

Based on this expansive authority and discretion, we implore BLM FFO to reconsider its assent to the nomination of the four parcels in January 2017 Oil and Gas Lease Sale, and remove these parcels from consideration.

III. The BLM Must Take a Hard Look at the Direct, Indirect and Cumulative Impacts of Oil and Gas Development on Certain Resource Values in the Planning Area.

The National Environmental Policy Act (“NEPA”), 42 U.S.C. § 4321 *et seq.*, and its implementing regulations, promulgated by the Council on Environmental Quality (“CEQ”), 40 C.F.R. §§ 1500.1 *et seq.*, is our “basic national charter for the protection of the environment.” 40 C.F.R. § 1500.1. Recognizing that “each person should enjoy a healthful environment,” NEPA ensures that the federal government uses all practicable means to “assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings,” and to “attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences,” among other policies. 43 U.S.C. § 4331(b).

NEPA regulations explain, in 40 C.F.R. §1500.1(c), that:

Ultimately, of course, it is not better documents but better decisions that count. NEPA’s purpose is not to generate paperwork – even excellent paperwork – but to foster excellent action. The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment.

Thus, while “NEPA itself does not mandate particular results, but simply prescribes the necessary process,” *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989), agency adherence to NEPA’s action-forcing statutory and regulatory mandates helps federal agencies ensure that they are adhering to NEPA’s noble purpose and policies. *See* 42 U.S.C. §§ 4321, 4331.

NEPA imposes “action forcing procedures . . . requir[ing] that agencies take a *hard look* at environmental consequences.” *Methow Valley*, 490 U.S. at 350 (citations omitted) (emphasis added). These “environmental consequences” may be direct, indirect, or cumulative. 40 C.F.R. §§ 1502.16, 1508.7, 1508.8. A cumulative impact – particularly important here – is defined as:

the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

40 C.F.R. § 1508.7.

Federal agencies determine whether direct, indirect, or cumulative impacts are significant by accounting for both the “context” and “intensity” of those impacts. 40 C.F.R. § 1508.27. Context “means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality” and “varies with the setting of the proposed action.” 40 C.F.R. § 1508.27(a). Intensity “refers to the severity of the impact” and is evaluated according to several additional elements, including, for example: unique characteristics of the geographic area such as ecologically critical areas; the degree to which the effects are likely to be highly controversial; the degree to which the possible

effects are highly uncertain or involve unique or unknown risks; and whether the action has cumulatively significant impacts. *Id.* §§ 1508.27(b).

Furthermore, the Federal Land Policy and Management Act (“FLPMA”), 43 U.S.C. § 1701 *et seq.*, directs that “the public lands be managed in a manner that will protect the quality of [critical resource] values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use.” 43 U.S.C. § 1701(a)(8). This substantive mandate requires that the agency not elevate the development of oil and gas resources above other critical resource values in the planning area. To the contrary, FLPMA requires that where oil and gas development would threaten the quality of critical resources, that conservation of these resources should be the preeminent goal. As detailed, below, for several critical resource values in the planning area, the proposed action conflicts with the BLM’s mandate under FLPMA.

A. An Agency fails to take a “hard look” if it predetermines its NEPA analysis.

NEPA “requires ... that an agency give a ‘hard look’ to the environmental impact of any project or action it authorizes.” *Morris v. U.S. Nuclear Regulatory Commission*, 598 F.3d 677, 681 (10th Cir. 2010). This examination “must be taken objectively and in good faith, not as an exercise in form over substance, and not as a subterfuge designed to rationalize a decision already made.” *Forest Guardians*, 611 F.3d at 712 (quoting *Metcalf v. Daley*, 214 F.3d 1135, 1142 (9th Cir. 2000)); *see also* 40 C.F.R. § 1502.2(g) (“Environmental impact statements shall serve as the means of assessing the environmental impact of proposed agency actions, rather than justifying decisions already made.”); *id.* § 1502.5 (“The statement shall be prepared early enough so that it can serve practically as an important contribution to the decision-making process and will not be used to rationalize or justify decisions already made.”).

As soon as BLM sells an oil and gas parcel – particularly, as here, when the lease may be sold without a no surface occupancy (“NSO”) stipulation – that sale confers a guaranteed right to the leaseholder, which includes the right of occupancy. In other words, once a lease sale occurs, the agency’s options regarding management of that parcel is severely restrained. Without analyzing impacts from the lease sale itself, any subsequent analysis intrinsically shifts from *preventing* impacts (and managing lands for other resource values) to merely *mitigating* impacts (and allowing oil and gas lessees to exercise their surface use rights to the lease at the expense of other resource values). This approach is fundamentally incongruous with NEPA’s mandate. The Ninth Circuit has noted: “In a way, reliance on mitigation measures presupposes approval. It assumes that – regardless of what effects construction may have on resources – there are mitigation measures that might counteract the effect without first understanding the extent of the problem. This is inconsistent with what NEPA requires.” *Northern Plains Resource Council v. Surface Transportation Board*, 668 F.3d 1067, 1084-85 (9th Cir. 2011). It is critical that BLM’s FFO avoid this scenario. If not otherwise withdrawn, as discussed above, the use of NSO stipulations should predominate the parcels offered, and mitigation should be relied upon only where such management is clearly supported by detailed site-specific analysis.

BLM, in making a predetermined conclusion, creates an unlevel playing field that benefits oil and gas leasing and drilling at the expense of other multiple use resources. There is a

long line of cases that warn agencies against making a predetermined decision with respect to their NEPA analysis. The Tenth Circuit Court of Appeals has cautioned: “[I]f an agency predetermines the NEPA analysis by committing itself to an outcome, the agency likely has failed to take a hard look at the environmental consequences of its actions due to its bias in favor of that outcome and, therefore, has acted arbitrarily and capriciously.” *Forest Guardians*, 611 F.3d at 713 (citing *Davis v. Mineta*, 302 F.3d 1104 (10th Cir. 2002)). The Tenth Circuit further stated that “[w]e [have] held that ... predetermination [under NEPA] resulted in an environmental analysis that was tainted with bias” and was therefore not in compliance with the statute. *Id.* (citing *Davis*, 302 F.3d at 1112–13, 1118–26)).

While the threshold for finding agency predetermination is high – “occur[ing] only when an agency *irreversibly and irretrievably* commits itself to a plan of action that is dependent upon the NEPA environmental analysis producing a certain outcome, *before* the agency has completed that environmental analysis,” *Forest Guardians*, 611 F.3d at 714 (emphasis in original) – here, BLM’s misguided process threatens to meet that threshold. For example, BLM has already identified dates for public involvement – providing that scoping is no later than June 20, 2016, which will be followed by review of the Draft Environmental Analysis (“EA”) and a protest period in advance of the lease sale. This suggests that, regardless of what the agency’s environmental analysis indicates, the proposed parcels will be offered for competitive sale in January 2017. Adherence to this timeframe would require that the agency reach a finding of no significant impact (“FONSI”), based not on any actual analysis of impacts, but rather on the predetermined decision to maintain a schedule despite its findings. At a minimum, this creates an improper “inertial presumption” in favor of committing resources to oil and gas development before knowing the site-specific impacts of oil and gas development. *Natl. Wildlife Fed. v. Morton*, 393 F.Supp 1286, 1292 (D.D.C. 1975).

By reaching, in effect, a predetermined decision – or at least creating a presumption in favor of oil and gas leasing and development – BLM not only violates NEPA, but also, by elevating development of oil and gas over other multiple use resources, FLPMA. As the Tenth Circuit has explained:

It is past doubt that the principle of multiple use does not require BLM to prioritize development over other uses... Development is a *possible* use, which BLM must weigh against other possible uses – including conservation to protect environmental values, which are best assessed through the NEPA process.

New Mexico ex rel. Richardson v. Bureau of Land Management, 565 F.3d 683, 710 (10th Cir. 2009). BLM’s presupposition of outcome is a direct affront to both NEPA and FLPMA, and cannot be sustained.

B. Because an irretrievable commitment of resources will occur at the lease sale stage, BLM must consider impacts prior to the sale.

In the past, BLM has stated its intent to defer NEPA analysis to determine whether significant impacts exist until the application for permit to drill (“APD”) stage. Given the timeline provided, as noted above, BLM FFO threatens to adopt the same approach, here.

BLM has previously relied on *Park County Resource Council v. U.S. Department of Agriculture*, 817 F.2d 609 (10th Cir. 1987), to support its contention that site-specific NEPA analysis is not required until the APD stage. In *Park County*, the Court provided that “with appropriate lease stipulations aimed at protecting the environment, lease issuance itself, essentially a paper transaction, does not usually require prior preparation of an EIS.” *Park County*, 817 F.2d at 621 (emphasis added). *Park County*, however, does not stand for the proposition – as BLM has implied – that there is a categorical rule exempting BLM from ever performing site-specific analysis at the lease sale stage. Indeed, the 9th Circuit has consistently held that the sale of oil and gas leases is an irretrievable commitment of resources for which an EIS must be prepared. See, e.g., *Conner v. Burford*, 848 F.2d 1441 (9th Cir.1988); *Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1227 (9th Cir.1988). Further, *Park County* cannot be understood in a vacuum; as the Tenth Circuit more recently explained:

[T]here is no bright line rule that site-specific analysis may wait until the APD stage. Instead, the inquiry is necessarily contextual. Looking to the standards set out by regulation and by statute, assessment of all ‘reasonably foreseeable’ impacts must occur at the earliest practicable point, and must take place before an ‘irretrievable commitment of resources’ is made. 42 U.S.C. § 4332(2)(C)(v); *Pennaco Energy v. U.S. Dept. of Interior*, 377 F.3d 1147, 1160 (10th Cir. 2004); *Kern v. U.S. Bureau of Land Management*, 284 F.3d 1062, 1072 (9th Cir. 2002); 40 C.F.R. §§ 1501.2, 1502.22. Each of these inquiries is tied to the existing environmental circumstances, not to the formalities of agency procedures. Thus, applying them necessarily requires a fact-specific inquiry.

New Mexico ex rel. Richardson, 565 F.3d at 717-18. The Court has unambiguously stated that “[t]he operative inquiry [is] simply whether all foreseeable impacts of leasing [are] taken into account before leasing [can] proceed.” *Id.* at 717.

Indeed, in *Pennaco Energy*, the Court found: “A plan-level EIS for the area failed to address the possibility of CBM development, and a later EIS was prepared only after the leasing stage, and thus ‘did not consider whether leases should have been issued in the first place.’” *New Mexico*, 565 F. 3d. at 717 (citing *Pennaco Energy*, 377 F.3d at 1152). Moreover, the Court held that “[b]ecause the issuance of leases gave lessees a right to surface use, the failure to analyze CBM development impacts before the leasing stage foreclosed NEPA analysis from affecting the agency’s decision.” *Id.* (citing *Pennaco Energy*, 377 F.3d at 1160).

Unlike *Park County* where site-specific impacts were difficult to anticipate, here, like in *Pennaco Energy*, the impacts of leasing these four parcels are reasonably foreseeable: other lands in this area have already been leased and development is ongoing. Thus, as in *Pennaco Energy*, an EIS assessing the specific effects of oil and gas development is required before the leasing stage.

Moreover, irrespective of BLM’s ultimate conclusion with regard to stipulations, an irretrievable commitment of resources will be conferred at the lease sale stage; oil and gas leases confer “the right to use so much of the leased lands as is necessary to explore for, drill for, mine,

extract, remove and dispose of all the leased resource in a leasehold.” 40 C.F.R. § 3101.1-2; *Sierra Club v. Hodel*, 848 F.2d 1068, 1093 (10th Cir. 1988) (agencies are to perform hard look NEPA analysis “before committing themselves irretrievably to a given course of action so that the action can be shaped to account for environmental values”).

Yet, even if a parcel were to contain a NSO stipulation, the mere issuance of the lease confers a right to the resources thereunder. Whether through directional drilling or some other method of extraction, the leaseholder has an exercisable interest as soon as the lease is conferred, which it then relies upon in proceeding with its development plan. Therefore, significant environmental impacts, based on those lease rights, may also occur once a lease is issued. Although it is true that “some or all of the environmental consequences of oil and gas development may be mitigated through lease stipulations, it is equally true that the purpose of NEPA is to examine the foreseeable environmental consequences of a range of alternatives *prior* to taking an action that cannot be undone.” *Montana Wilderness Ass’n v. Fry*, 310 F.Supp.2d 1127, 1145 (D.Mont., 2004) (citation omitted) (emphasis added); 40 C.F.R. § 1501.2.

If BLM fails to perform site-specific analysis at the lease stage, BLM’s authority will thereafter be limited to imposing mitigation measures consistent with the terms of the lease. In other words, BLM FFO will not be able to impose conditions inconsistent with the lease terms and it cannot deny the developer the right to drill altogether. Consequently, if BLM discovers significant impacts at the APD stage, it may no longer be able to prevent them.

Because BLM is irretrievably committing resources at the lease sale stage, it must consider the impacts of its decision to lease parcels before it can confer public resources to a private developer in a lease – analysis which would be inherently flawed if performed without the benefit of a completed Mancos Shale RMP and EIS.

C. The preparation of an Environmental Impact Statement (“EIS”) is required prior to the issuance of the lease.

As the Tenth Circuit has explained, “[i]f the agency determines that its proposed action *may* ‘significantly affect’ the environment, the agency must prepare a detailed statement on the environmental impact of the proposed action in the form of an EIS.” *Airport Neighbors Alliance v. U.S.*, 90 F.3d 426, 429 (10th Cir. 1996) (citation omitted) (emphasis added). Similarly, according to the Ninth Circuit:

We have held that an EIS *must* be prepared if ‘substantial questions are raised as to whether a project ... *may* cause significant degradation to some human environmental factor.’ To trigger this requirement a ‘plaintiff need not show that significant effects *will in fact occur*,’ [but instead] raising ‘substantial questions whether a project may have a significant effect’ is sufficient.

Idaho Sporting Cong. v. Thomas, 137 F.3d 1146, 1149-50 (9th Cir. 1998) (citations omitted) (emphasis original).

If BLM FFO “decides not to prepare an EIS, ‘it must put forth a convincing statement of

reasons' that explains why the project will impact the environment no more than insignificantly. This account proves crucial to evaluating whether the [agency] took the requisite 'hard look.'" *Ocean Advoc. v. U.S. Army Corps of Engrs.*, 402 F.3d 846, 864 (9th Cir. 2005). In the instant case, however, the BLM FFO would be hard pressed to reach any conclusion other than that four parcels and approximately 843 acres of development in this area *may* result in significant degradation.

D. The BLM must take a "hard look" at impacts to air quality.

The BLM must take a hard look at the air quality impacts from oil and gas development in the planning area. Much of air pollution from oil and gas development and operations, which is specifically discussed, below, also degrades visibility. Section 169A of the Clean Air Act ("CAA"), 42, U.S.C. § 7401 *et seq.* (1970) sets forth a national goal for visibility, which is the "prevention of any future, and the remedying of any existing, impairment of visibility in Class I areas which impairment results from manmade air pollution." Congress adopted the visibility provisions in the CAA to protect visibility in "areas of great scenic importance." H.R. Rep. No. 294, 95th Cong. 1st Sess. at 205 (1977). In promulgating its Regional Haze Regulations, 64 Fed. Reg. 35,714 (July 1, 1999), the U.S. Environmental Protection Agency ("EPA") provided:

Regional haze is visibility impairment that is produced by a multitude of sources and activities which emit fine particles and their precursors and which are located across a broad geographic area. Twenty years ago, when initially adopting the visibility protection provisions of the CAA, Congress specifically recognized that the "visibility problem is caused primarily by emission into the atmosphere of SO₂, oxides of nitrogen, and particulate matter, especially fine particulate matter, from inadequate[ly] controlled sources." H.R. Rep. No. 95-294 at 204 (1977). The fine particulate matter (PM) (e.g., sulfates, nitrates, organic carbon, elemental carbon, and soil dust) that impairs visibility by scattering and absorbing light can cause serious health effects and mortality in humans, and contribute to environmental effects such as acid deposition and eutrophication.

The visibility protection program under sections 169A, 169B, and 110(a)(2)(J) of the CAA is designed to protect Class I areas from impairment due to manmade air pollution. The current regulatory program addresses visibility impairment in these areas that is "reasonably attributable" to a specific source or small group of sources, such as, here, air pollution resulting from oil and gas development and operations authorized by the LRMP. *See* 64 Fed. Reg. 35,714.

Moreover, EPA finds the visibility protection provisions of the CAA to be quite broad. Although EPA is addressing visibility protection in phases, the national visibility goal in section 169A calls for addressing visibility impairment generally, including regional haze. *See e.g., State of Maine v. Thomas*, 874 F.2d 883, 885 (1st Cir. 1989) ("EPA's mandate to control the vexing problem of regional haze emanates directly from the CAA, which 'declares as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in Class I areas which impairment results from manmade air pollution.'") (citation omitted).

Here, there are numerous Class I areas within or near the project area that may be

impacted by the proposed development, including: Bandelier National Monument, Wheeler Peak Wilderness, San Pedro Parks Wilderness, Cruces Basin Wilderness, Chama River Canyon Wilderness and Pecos Wilderness in New Mexico, as well as Weminuche Wilderness, La Garita Wilderness, South San Juan Wilderness, Great Sand Dunes National Park, and Mesa Verde National Park in Colorado.

In addition to impacts from the proposed development, cumulative air quality impacts from sources in and around the proposed development area may result in serious impairments. For example, there is considerable oil and gas development already taking place in the San Juan Basin, with approximately 23,000 active oil and gas wells, as well as significant emissions from coal-fired power plants at San Juan Generating Station and the Four Corners Power Plant.

The current status of air quality in an area is a fundamental consideration for analysis in the agency's NEPA analysis. Background monitored concentrations of all pollutants should be reviewed. Given the increasing development in the area, there may be higher concentrations that should be reflected. In particular, elevated monitored levels for the 8-hour ozone National Ambient Air Quality Standard ("NAAQS") in this area in recent years are very concerning. Exposure to ozone is a serious concern as it can cause or exacerbate respiratory health problems, including shortness of breath, asthma, chest pain and coughing, decreased lung function and even long-term lung damage, as discussed in greater detail below. *See also*, EPA's National Ambient Air Quality Standards for Particulates and Ozone, 62 FR 38,856 (July 18, 1997). According to a recent report by the National Research Council ("NRC"): "short-term exposure to current levels of ozone in many areas is likely to contribute to premature deaths."² Even ozone concentrations at levels as low as 60 ppb can be considered harmful to human health and the agencies should consider this when evaluating the air impacts that would result from developing these 26 parcels.

Elevated ozone concentrations have been recorded in recent years at eight monitors in the Four Corners Area. For example, the background value given for Mesa Verde is 142 $\mu\text{g}/\text{m}^3$, which is just under the NAAQS.³ Thus, the increased oil and gas development that will take place under the proposed action would be an important contributor to the ozone problem in the area. There is no room for growth in emissions that contribute to these harmful levels of ozone pollution in the area – namely, nitrogen oxides ("NO_x") and volatile organic compounds ("VOCs"). Any increase in emissions of ozone precursors will exacerbate the negative health effects of ozone in the region, as discussed below, and is almost certain to threaten the area's compliance with EPA's the ozone standard.

Additionally, PM_{2.5} is another potential area of major health impacts in the area. PM_{2.5} can become lodged deep in the lungs or can enter the blood stream, worsening the health of asthmatics and even causing premature death in people with heart and lung disease. Even PM_{2.5}

² National Research Council, *Link Between Ozone Air Pollution and Premature Death Confirmed*, (April 2008), available at: <http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=12198>.

³ The 75 ppb 8-hour ozone standard of 75 ppb translates to 150 $\mu\text{g}/\text{m}^3$.

concentrations lower than the current NAAQS are a concern for human health. While background PM_{2.5} values are not at the level of the NAAQS currently, it is likely that those levels will increase with continued development in the area. Elevated wintertime concentrations could become an issue as they have in other areas of concentrated oil and gas development in the West, such as in the Uinta Basin in Utah.⁴

Also critical to the BLM's analysis of air quality impacts is the relationship to human health. Logically, the required air quality mitigation measures would have a positive relationship to human health, but poor baseline air quality conditions due to direct, indirect and cumulative impacts in the planning area warrants an independent hard look analysis at human health; and, moreover, such analysis is required by NEPA and CEQ implementing regulations.

Research indicates a strong correlation between oil and gas development and increased ozone concentrations – particularly in the summer when warm, stagnant conditions yield an increase in O₃ from oil and gas emissions.⁵ Particularly in areas of significant existing oil and gas development – such as the San Juan Basin in the Four Corners region, which was the focus of research, here – summertime “peak incremental O₃ concentration of 10 ppb” have been simulated. *Id.* at 1118. This study indicates a “clear potential for oil and gas development to negatively affect regional O₃ concentrations in the western United States, including several treasured national parks and wilderness areas in the Four Corners region – particularly Mesa Verde and the Weminuche Wilderness. “It is likely that accelerated energy development in this part of the country will worsen the existing problem.”⁶ Additionally, oil and gas production in the mountain west has recently been linked to *winter* ozone levels that greatly exceed the National Ambient Air Quality Standards (“NAAQS”).⁷

As the Endocrine Disruption Exchange has noted:

⁴ Several very high values of PM_{2.5} were recorded in Vernal, Utah starting in 2007, including six exceedances of the 24-hour PM_{2.5} NAAQS and a maximum 24-hour average PM_{2.5} concentration of 63 µg/m³. In 2009, there were three recorded exceedances of the 24-hour average PM_{2.5} NAAQS in Roosevelt, Utah with 24-hour average concentrations reaching 42 µg/m³ and four recorded exceedances in Vernal with 24-hour average concentrations as high as 60.9 µg/m³.

⁵ Marco A Rodriguez, et al., *Regional Impacts of Oil and Gas Development on Ozone Formation in the Western United States*, JOURNAL OF AIR & WASTE MANAGEMENT ASSOCIATION (Sept. 2009).

⁶ See Rodriguez at 1118.

⁷ See Gail Tonnesen and Richard Payton, EPA Region 8. *Winter Ozone Formation: Results from the Wyoming Upper Green River Basin Studies and Plans for the 2012, Uintah Basin Study* (seminar abstract) (Jan. 2012), available at: <http://www.esrl.noaa.gov/csd/seminars/2012/TonnesenPayton.html> (citing, *inter alia*, Schnell, et. al., *Rapid photochemical production ozone at high concentrations in a rural site during winter*, 2 Nature Geosci. 120-122 (2009).

In addition to the land and water contamination issues, at each stage of production and delivery tons of toxic volatile compounds, including benzene, toluene, ethylbenzene, xylene, etc., and fugitive natural gas (methane), escape and mix with nitrogen oxides from the exhaust of diesel-driven, mobile and stationary equipment to produce ground-level ozone. Ozone combined with particulate matter less than 2.5 microns produces smog (haze). Gas field produced ozone has created a serious air pollution problem similar to that found in large urban areas, and can spread up to 200 miles beyond the immediate region where gas is being produced. Ozone not only causes irreversible damage to the lungs, it is equally damaging to conifers, aspen, forage, alfalfa, and other crops commonly grown in the West. Adding to this is the dust created by fleets of diesel-driven water trucks working around the clock hauling the constantly accumulating condensate water from well pads to central evaporation pits.⁸

Increases in ground-level ozone not only impact regional haze and visibility, but can also result in dramatic impacts to human health. According to the EPA:

Breathing ground-level ozone can result in a number of health effects that are observed in broad segments of the population. Some of these effects include:

- Induction of respiratory symptoms
- Decrements in lung function
- Inflammation of airways

Respiratory symptoms can include:

- Coughing
- Throat irritation
- Pain, burning, or discomfort in the chest when taking a deep breath
- Chest tightness, wheezing, or shortness of breath

In addition to these effects, evidence from observational studies strongly indicates that higher daily ozone concentrations are associated with increased asthma attacks, increased hospital admissions, increased daily mortality, and other markers of morbidity. The consistency and coherence of the evidence for effects upon asthmatics suggests that ozone can make asthma symptoms worse and can increase sensitivity to asthma triggers.⁹

⁸ The Endocrine Disruption Exchange. Undated. *Chemicals In Natural Gas Operations: Health Effects Spreadsheet and Summary*, available at: <http://www.endocrinedisruption.com/chemicals.multistate.php>.

⁹ EPA, *Health Effects of Ozone in the General Population*, available at: <http://www.epa.gov/apti/ozonehealth/population.html>.

Oil and gas development is one of the largest sources of VOCs, ozone, and sulfur dioxide emissions in the United States. The relationship between air quality and human health must be analyzed in the agency's NEPA analysis. "The agency must examine the relevant data and articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.'" *Motor Vehicle Mfrs.*, 463 U.S. at 43 (1983).

a. New Ozone Standards

Ozone has long been recognized to cause adverse health effects. Short term exposure to ozone causes multiple negative respiratory effects, from inflammation of airways to more serious respiratory effects that can lead to use of medication, absences from school and work, hospital admission, emergency room visits, and chronic obstructive pulmonary disease ("COPD"). Respiratory harm from ozone exposure, even at current standards, can harm healthy people. The impacts are much more serious for people with lung disease, such as asthma. Long-term exposure to elevated levels of ozone results in numerous negative harmful effects, such as permanent lung damage and abnormal lung development in children. Long-term exposure may also increase risk of death from respiratory problems. Short- and long-term exposure to elevated levels of ozone can also harm people's hearts and cardiovascular system. *See* 79 Fed. 75234-311.

On December 17, 2014, EPA published a proposal to revise NAAQS for ozone to 65 to 70 parts per billion (ppb) from the current 75 ppb. National Ambient Air Quality Standards for Ozone, 79 Fed. Reg. 75234 (Dec. 17, 2014). This decision was driven by significant recent scientific evidence that the current standard of 75 ppb does not adequately protect public health and that ozone concentrations as low as 72 ppb can cause respiratory harm to young, healthy adults following exposure for less than eight hours. *Id.* at 75249-311 (citing controlled human exposure studies documenting adverse effects to lung function from ozone concentrations of 60 ppb and 72 ppb and epidemiologic panel studies documenting short- and long-term respiratory harms in cities that meet the 75 ppb ozone standard).¹⁰ Recent studies have also documented decreased lung functioning and airway inflammation in young, healthy adults at ozone concentrations as low as 60 ppb; these effects, if repeated, can lead to more serious respiratory impairments. *Id.* at 75280, 75305.

Studies have documented "significant associations with respiratory emergency department visits with children and adults" in places that met the current standard of 75 ppb, but would not have met the proposed standards of 65-70 ppb. *Id.* at 75283-85, 75307 (citing Mar and Koenig, 2009; Dales et al., 2006). The existing standard is plainly insufficient to protect children with asthma and members of other sensitive groups. *Id.* at 75285-87. These impacts will be exacerbated by the worsening impacts of climate change. *Id.* at 75242.

In short, the best science shows that the 75 ppb standard is inadequate to protect public health: "the respiratory effects experienced following exposures to O₃ concentrations lower than

¹⁰ Brown et al., 2008; Kim et al., 2011; Schelegle et al., 2009; Adams 2002; Adams 2008; Brunekreef et al., 1994; Spektor et al., 1988a; Ulmer et al., 1997; Gielen et al., 1997; Mar and Koenig, 2009.

75 ppb could be adverse to some individuals, particularly if experienced by members of at risk populations (e.g., people with asthma, children).” *Id.* at 75280.

Revision of the ozone standard from 75 ppb to 65 or 70 ppb is expected to lead to “meaningful reductions in mean premature mortality.” *Id.* at 75308. The Clean Air Scientific Advisory Committee (CASAC) has noted that even a reduced standard of 70 ppb may not be sufficient to protect public health with an adequate margin of safety, and that a standard as low as 60 ppb would be scientifically justified. *Id.* at 75309-10. CASAC concluded that adverse respiratory effects “almost certainly occur” at lower levels for potentially at risk populations, such as children, the elderly, and people with asthma, people who are active or work outdoors, and people with lung diseases such as COPD. *Id.* at 75305. Thus, a lower level is necessary in order to protect the broader population. *Id.*

NEPA imposes on federal agencies a continuing duty to supplement draft or final environmental impact statements in response to significant new circumstances or information relevant to environmental concerns and bearing on the proposed action. *Idaho Sporting Cong., Inc. v. Alexander*, 222 F.3d 562, 566 n.2 (9th Cir. 2000); 40 C.F.R. § 1502.9(c)(1)(i). Here, EPA’s proposal to revise ozone standards, as well as the science supporting the revision, constitute new circumstances and information, which BLM must take account of in its final EIS. The FEIS’s conclusions regarding ozone are based on comparison to the existing NAAQS for ozone. EPA’s proposed revision of the ozone NAAQS and the abundant science supporting the proposal plainly demonstrate that the current NAAQS are not sufficient to protect public health.

E. The BLM must take a “hard look” at climate change.

If we are to stem the impacts of climate change and manage for sustainable ecosystems, not only must the BLM take a hard look at greenhouse gas (“GHG”) emissions from the proposed development, but its decision must be reflective of the challenges we face.

The EPA has determined that human emissions of greenhouse gases are causing global warming that is harmful to human health and welfare. *See* 74 Fed. Reg. 66,496 (Dec. 15, 2009), *Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act*. The D.C. Circuit has upheld this decision as supported by the vast body of scientific evidence on the subject. *See Coal. for Responsible Regulation, Inc. v. E.P.A.*, 684 F.3d 102, 120-22 (D.C. Cir. 2012). Indeed, EPA could not have found otherwise, as virtually every climatologist in the world accepts the legitimacy of global warming and the fact that human activity has resulted in atmospheric warming and planetary climate change.¹¹ The world’s

¹¹ *See, e.g.,* See INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *The Science of Climate Change* (1995); U.S. Climate Change Science Program, *Abrupt Climate Change* (Dec. 2008); James Hansen, et. al., *Global Surface Temperature Change*, REVIEWS OF GEOPHYSICS, 48, RG4004 (June 2010); *see also*, Richard A. Muller, *Conversion of a Climate Change Skeptic*, NEW YORK TIMES, July 28, 2012 (citing Richard A. Muller, et. al., *A New Estimate of the Average Earth Surface Temperature, Spanning 1753 to 2011*; Richard A. Muller, et. al., *Decadal Variations in the Global Atmospheric Land Temperatures*).

leading minds and most respected institutions – guided by increasingly clear science and statistical evidence – agree that dramatic action is necessary to avoid planetary disaster.¹² GHG concentrations have been steadily increasing over the past century,¹³ and our insatiable consumption of fossil fuels is pushing the world to a tipping point where, once reached, catastrophic change will be unavoidable.¹⁴ In fact, the impacts from climate change are already being experienced, with drought and extreme weather events becoming increasingly common.¹⁵

Renowned NASA climatologist, Dr. James Hansen, provides the analogy of loaded dice – suggesting that there still exists some variability, but that climate change is making these

¹² See, e.g., Rob Atkinson, et. al., *Climate Pragmatism: Innovation, Resilience, and No Regrets* (July 2011); Veerabhadran Ramanathan, et. al., *The Copenhagen Accord for Limiting Global Warming: Criteria, Constraints, and Available Avenues* (Feb. 2010); UNITED NATIONS, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *Climate Change 2007: Synthesis Report* (2007); A.P. Sokolov, et. al., *Probabilistic Forecast for Twenty-First-Century Climate Based on Uncertainties in Emissions (without Policy) and Climate Parameters*, MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT) (Oct. 2009); UNITED NATIONS, FRAMEWORK CONVENTION ON CLIMATE CHANGE, *Report of the Conference of the Parties* (Dec. 2011); Bill McKibben, *Global Warming's Terrifying New Math*, ROLLING STONE, July 19, 2012; Elizabeth Muller, *250 Years of Global Warming*, BERKLEY EARTH, July 29, 2012; Marika M. Holland, et. al., *Future abrupt reductions in summer Arctic sea ice*, *Geophysical Research Letters*, Vol. 33, L23503 (2006).

¹³ See Randy Strait, et. al., *Final Colorado Greenhouse Gas Inventory and Reference Case Projections: 1990-2020*, CENTER FOR CLIMATE STRATEGIES (Oct. 2007); Robin Segall et. al., *Upstream Oil and Gas Emissions Measurement Project*, U.S. ENVIRONMENTAL PROTECTION AGENCY; Lee Gribovicz, *Analysis of States' and EPA Oil & Gas Air Emissions Control Requirements for Selected Basins in the Western United States*, WESTERN REGIONAL AIR PARTNERSHIP (Nov. 2011).

¹⁴ See, e.g., James Hansen, *Tipping Point: Perspective of a Climatologist*, STATE OF THE WILD 2008-2009; GLOBAL CARBON PROJECT, *A framework for Internationally Co-ordinated Research on the Global Carbon Cycle*, ESSP Report No. 1; INTERNATIONAL ENERGY AGENCY, *CO₂ Emissions from Fuel Combustion, Highlights 2011*; GLOBAL CARBON PROJECT, *10 Years of Advancing Knowledge on the Global Carbon Cycle and its Management*; Malte Meinshausen, et. al., *Greenhouse-gas emission targets for limiting global warming to 2° C*, NATURE, Vol. 458, April 30, 2009.

¹⁵ See, e.g., UNITED NATIONS, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation* (2011); Aiguo Dai, *Increasing drought under global warming in observations and models*, NATURE: CLIMATE CHANGE (Aug. 2012); Stephen Saunders, et. al., *Hotter and Drier: The West's Changed Climate* (March 2008).

extreme events ever more common.¹⁶ In turn, climatic change and GHG emissions are having dramatic impacts on plant and animal species and habitat, threatening both human and species resiliency and the ability to adapt to these changes.¹⁷ According to experts at the Government Accountability Office (“GAO”), federal land and water resources are vulnerable to a wide range of effects from climate change, some of which are already occurring. These effects include, among others, “(1) physical effects, such as droughts, floods, glacial melting, and sea level rise; (2) biological effects, such as increases in insect and disease infestations, shifts in species distribution, and changes in the timing of natural events; and (3) economic and social effects, such as adverse impacts on tourism, infrastructure, fishing, and other resource uses.”¹⁸

Despite the strength of these findings, the BLM has historically failed to take serious action to address impacts. This type of dismissive approach fails to satisfy the guidance outlined in Department of Interior Secretarial Order 3226, discussed below, or the requirements of NEPA. “Reasonable forecasting and speculation is . . . implicit in NEPA, and we must reject any attempt by agencies to shirk their responsibilities under NEPA by labelling any and all discussion of future environmental effects as ‘crystal ball inquiry.’” *Save Our Ecosystems v. Clark*, 747 F.2d 1240, 1246 n.9 (9th Cir. 1984 (quoting *Scientists’ Inst. for Pub. Info., Inc. v. Atomic Energy Comm.*, 481 F.2d 1079, 1092 (D.C. Cir. 1973)).

As noted above, NEPA imposes “action forcing procedures . . . requir[ing] that agencies take a *hard look* at environmental consequences.” *Methow Valley*, 490 U.S. at 350 (citations omitted) (emphasis added). These “environmental consequences” may be direct, indirect, or cumulative. 40 C.F.R. §§ 1502.16, 1508.7, 1508.8. BLM is required to take a hard look at those impacts as they relate to the agency action. “Energy-related activities contribute 70% of global GHG emissions; oil and gas together represent 60% of those energy-related emissions through their extraction, processing and subsequent combustion.”¹⁹ Even if science cannot isolate each

¹⁶ See, James Hansen, et. al., *Climate Variability and Climate Change: The New Climate Dice* (Nov. 2011); James Hansen, et. al., *Perception of Climate Change* (March 2012); James Hansen, et. al., *Increasing Climate Extremes and the New Climate Dice* (Aug. 2012).

¹⁷ See Fitzgerald Booker, et. al., *The Ozone Component of Climate Change: Potential Effects on Agriculture and Horticultural Plant Yield, Product Quality and Interactions with Invasive Species*, J. INTEGR. PLANT BIOL. 51(4), 337-351 (2009); Peter Reich, *Quantifying plant response to ozone: a unifying theory*, TREE PHYSIOLOGY 3, 63-91 (1987).

¹⁸ GAO Report, *Climate Change: Agencies Should Develop Guidance for Addressing the Effects on Federal Land and Water Resources* (2007); see also Committee on Environment and Natural Resources, National Science and Technology Council, *Scientific Assessment of the Effects of Global Climate Change on the United States* (2008); Melanie Lenart, et. al. *Global Warming in the Southwest: Projections, Observations, and Impacts* (2007) (describing impacts from temperature rise, drought, floods and impacts to water supply on the southwest).

¹⁹ International Investors Group on Climate Change, *Global Climate Disclosure Framework for Oil and Gas Companies*.

additional oil or gas well's contribution to these overall emissions, this does not obviate BLM's responsibility to consider oil and gas development in the action area from the cumulative impacts of the oil and gas sector. In other words, the BLM cannot ignore the larger relationship that oil and gas management decisions have to the broader climate crisis that we face. Here, the agency's analysis must include the full scope of GHG emissions. *See Neighbors of Cuddy Mountain v. U.S. Forest Service*, 137 F.3d 1372, 1379 (9th Cir. 1998) ("To 'consider' cumulative effects, some quantified or detailed information is required. Without such information, neither the courts nor the public, in reviewing the [agency's] decisions, can be assured that the [agency] provided the hard look that it is required to provide."). If we are to stem climate disaster – the impacts of which we are already experiencing – the agency's decisionmaking must be reflective of this reality and plan accordingly.

BLM is, at the end of the day, responsible for the management of 700 million acres of federal onshore subsurface minerals.²⁰ Indeed, "the ultimate downstream GHG emissions from fossil fuel extraction from federal lands and waters by private leaseholders could have accounted for approximately 23% of total U.S. GHG emissions and 27% of all energy-related GHG emissions."²¹ This suggests that "ultimate GHG emissions from fossil fuels extracted from federal lands and waters by private leaseholders in 2010 could be more than 20-times larger than the estimate reported in the CEQ inventory, [which estimates total federal emissions from agencies' operations to be 66.4 million metric tons]. Overall, ultimate downstream GHG emissions resulting from fossil fuel extraction from federal lands and waters by private leaseholders in 2010 are estimated to total 1,551 [million metric tons of CO₂ equivalent ("MMTCO₂e")]." *Id.* In 2010, the GAO estimated that BLM could eliminate up to 40% of methane emissions from federally authorized oil and natural gas development, the equivalent of eliminating 126 Bcf or 46.3 MMTCO₂e of GHG pollution annually and equivalent to roughly 13 coal-fired power plants.²² To suggest that the agency does not, here, have to account for GHG pollution from oil and gas development authorized by the FFO, would be to suggest that the collective 700 million acres of subsurface mineral estate is not relevant to protecting against climate change. This sort of flawed, reductive thinking would be problematic, and contradicted by the agency's very management framework that provides a place-based lens to account for specific pollution sources to ensure that the broader public interest is protected. Therefore, even though climate change emissions from the proposed action may look minor when viewed in isolation, when considered cumulatively with all of the other GHG emissions from BLM-

²⁰ *See* DOI-BLM, *Mineral and Surface Acreage Managed By BLM*, available at: http://www.blm.gov/wo/st/en/info/About_BLM/subsurface.html.

²¹ Stratus Consulting, prepared for: The Wilderness Society, *Greenhouse Gas Emissions from Fossil Energy Extracted from Federal Lands and Waters*, Feb. 1, 2012.

²² GAO, *Federal Oil & Gas Leases: Opportunities Exist to Capture Vented and Flared Natural Gas, Which Would Increase Royalty Payments and Reduce Greenhouse Gases*, GAO-11-34 at 12 (Table 1)(October 2010) (attached as Exhibit 46). This GHG equivalence assumes a CH₄ warming potential of 72 (20-year warming period) as per the Intergovernmental Panel on Climate Change's Fourth Assessment Report and using EPA's GHG equivalencies calculator.

managed land, they become significant and cannot be ignored.

a. Social cost of carbon.

Research conducted by the National Research Council has confirmed the fact that the negative impacts of energy generation from fossil fuels are not represented in the market price for such generation.²³ In other words, failing to internalize the externalities of energy generation from fossil fuels—such as the impacts to climate change and human health—has resulted in a market failure that requires government intervention. Executive Order 12866 directs federal agencies to assess and quantify such costs and benefits of regulatory action, including the effects on factors such as the economy, environment, and public health and safety, among others. *See* Exec. Order No. 12866, 58 Fed. Reg. 51,735 (Sept. 30, 1993).²⁴ The Ninth Circuit has ruled that agencies must include the climate benefits of a significant regulatory action in federal cost-benefit analyses to comply with EO 12866.

[T]he fact that climate change is largely a global phenomenon that includes actions that are outside of [the agency's] control ... does not release the agency from the duty of assessing the effects of its actions on global warming within the context of other actions that also affect global warming.

Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin., 538 F.3d 1172, 1217 (9th Cir. 2008) (quotations and citations omitted); *see also Border Power Plant Working Grp. v. U.S. Dep't of Energy*, 260 F. Supp. 2d 997, 1028-29 (S.D. Cal. 2003) (finding agency failure to disclose project's indirect carbon dioxide emissions violates NEPA).

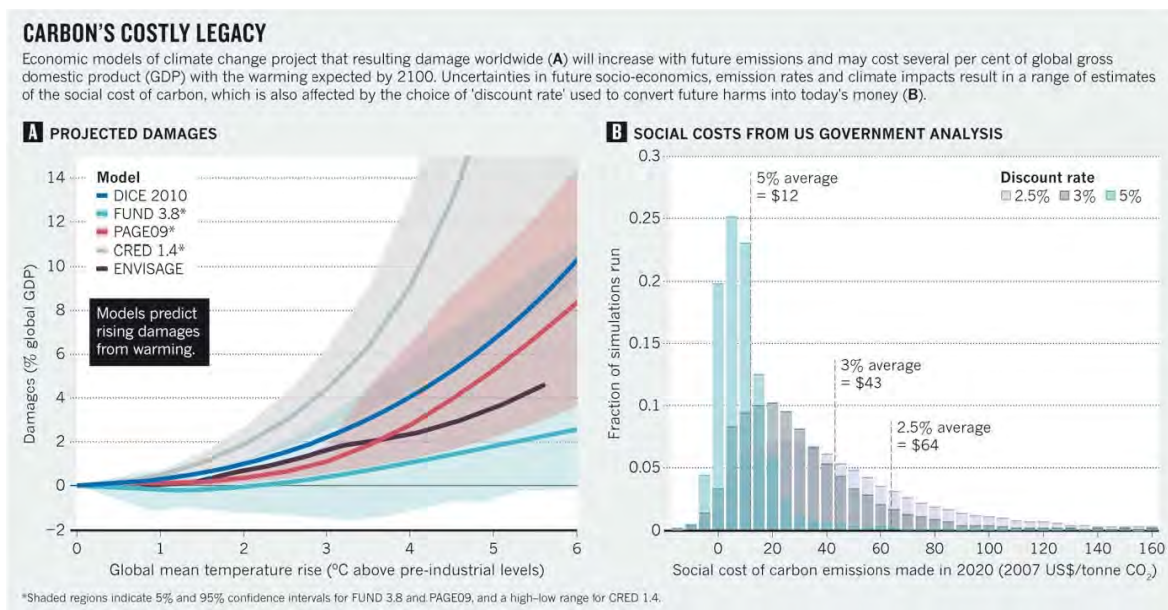
In response, an Interagency Working Group (“IWG”) was formed to develop a consistent and defensible estimate of the social cost of carbon—allowing agencies to “incorporate the social benefits of reducing carbon dioxide (CO₂) emissions into cost-benefit analyses of regulatory actions that impact cumulative global emissions.”²⁵ In other words, SCC is a measure of the benefit of reducing greenhouse gas emissions now and thereby avoiding

²³ *See, e.g.*, National Research Council, *Hidden Costs of Energy: Unpriced Consequences of Energy Production and Use* (2010); Nicholas Muller, et. al., *Environmental Accounting for Pollution in the United States Economy*, AMERICAN ECONOMIC REVIEW (Aug. 2011); *see also*, Generation Investment Management, *Sustainable Capitalism*, (Jan. 2012) (advocating a paradigm shift to “a framework that seeks to maximize long-term economic value creation by reforming markets to address real needs while considering *all* costs and stakeholders.”).

²⁴ *See also* Executive Order 13563, 76 Fed. Reg. 3821 (Jan. 18, 2011) (reaffirming the framework of EO 12866 and directing federal agencies to conduct regulatory actions based on the best available science).

²⁵ *See* Interagency Working Group on the Social Cost of Carbon, United States Government, *Technical Support Document: Technical Update on the Social Cost of Carbon for Regulatory Impact Analysis – Under Executive Order 12866* (May 2013) at 2 (hereinafter 2013 TSD).

costs in the future.²⁶ The charts below depict, (A) dramatically increasing damages from global warming over time, as well as (B) the social cost of these carbon emissions based on 2013 TDS values.²⁷



Leading economic models all point in the same direction: that climate change causes substantial economic harm, justifying immediate action to reduce emissions.²⁸ The interagency process to develop SCC estimates—originally described in the 2010 interagency technical support document (“TSD”), and updated in 2013—developed four values based on the average SCC from three integrated assessment models (DICE, PAGE, and FUND), at discount rates of 2.5, 3, and 5 percent,²⁹ as well as a fourth value demonstrating the cost of worst-case impacts.³⁰

²⁶ See Ruth Greenspan and Dianne Callan, *More than Meets the Eye: The Social Cost of Carbon in U.S. Climate Policy*, in Plain English, WORLD RESOURCES INSTITUTE (July 2011).

²⁷ See Richard Revesz, et al., *Global warming: Improve economic models of climate change*, NATURE 508, 173-175 (April 10, 2014).

²⁸ See NATURE 508 at 174.

²⁹ The choice of which discount rate to apply—translating future costs into current dollars—is critical in calculating the social cost of carbon. The higher the discount rate, the less significant future costs become, which shifts a greater burden to future generations based on the notion that the world will be better able to make climate investments in the future. The underlying assumption of applying a higher discount rate is that the economy is continually growing. The IWG’s “central value” of three percent is consistent with this school of thought—that successive generations will be increasingly wealthy and more able to carry the financial burden of climate impacts. “The difficulty with this argument is that, as climate change science becomes increasingly concerning, it becomes a weaker bet that future generations will be better off. If they are not, lower or negative discount rates are justified.” WRI Report, at 9. “Three percent

These models are intended to quantify damages, including health impacts, economic dislocation, agricultural changes, and other effects that climate change can impose on humanity. While these values are inherently speculative, a recent GAO report has confirmed the soundness of the methodology in which the IWG's SCC estimates were developed, therefore further underscoring the importance of integrating SCC analysis into the agency's decisionmaking process.³¹ In fact, certain types of damages remain either unaccounted for or poorly quantified in IWG's estimates, suggesting that the SCC values are conservative and should be viewed as a lower bound.³²

The updated interagency SCC estimates for 2020 are \$12, \$43, \$65 and \$129 (in 2007\$).³³ The IWG does not instruct federal agency which discount rate to use, suggesting that the 3 percent discount rate (\$43 per ton of CO₂) as the "central value," but further emphasizing "the importance and value of including all four SCC values[;]" i.e., that the agency should use the range of values in developing NEPA alternatives.³⁴

The agency's obligation to analyze the costs associated with GHG emissions through NEPA was directly affirmed by the court in *High Country Conservation Advocates v. U.S. Forest Service*, 52 F.Supp.3d 1174 (D.Colo. 2014) (a decision the agency decided not to appeal, thus implicitly recognizing the importance of incorporating a social cost of carbon analysis into NEPA decisionmaking). In his decision, Judge Jackson identified the IWG's SCC protocol as a tool to "quantify a project's contribution to costs associated with global climate change." *Id.* at 1190.³⁵ To fulfill this mandate, they agency must disclose the "ecological[,] ...

values an environmental cost or benefit occurring 25 years in the future at about half as much as the same benefit today." *Id.*

³⁰ See 2013 TSD at 2.

³¹ GAO-14-663, *Social Cost of Carbon* (July 24, 2014).

³² See Peter Howard, et al., *Omitted Damages: What's Missing From the Social Cost of Carbon*, ENVIRONMENTAL DEFENSE FUND, INSTITUTE FOR POLICY INTEGRITY, NATURAL RESOURCES DEFENSE COUNCIL (March 13, 2014) (providing, for example, that damages such as "increases in forced migration, social and political conflict, and violence; weather variability and extreme weather events; and declining growth rates" are either missing or poorly quantified in SCC models).

³³ See 2013 TSD at 3 (including a table of revised SCC estimates from 2010-2050). To put these figures in perspective, in 2009 the British government used a range of \$41-\$124 per ton of CO₂, with a central value of \$85 (during the same period, the 2010 TSD used a central value of \$21). WRI Report at 4. The UK analysis used very different assumptions on damages, including a much lower discount rate of 1.4%. The central value supports regulation four times as stringent as the U.S. central value. *Id.*

³⁴ See 2013 TSD at 12.

³⁵ See also *id.* at 18 (noting the EPA recommendation to "explore other means to characterize the impact of GHG emissions, including an estimate of the 'social cost of carbon' associated with

economic, [and] social” impacts of the proposed action. 40 C.F.R. § 1508.8(b). Simple calculations applying the SCC to GHG emissions from this project offer a straightforward comparative basis for analyzing impacts, and identifying very significant costs.³⁶

Notably, according to the IPCC, the 20-year GWP for methane—which is the relevant timeframe for consideration if we are to stem the worst of climate change—is 87.³⁷ While BLM fails to quantify what percentage of stated GHG emissions from the project are from methane, EPA estimates provide that approximately 97% of emissions from oil production in the San Juan Basin are from methane.

Critically, however, the agency must not only quantify the estimated emissions from the projects *production*, but also the indirect impacts of combustion, as NEPA demands. *See* 40 C.F.R. § 1508.25(c). The final consumption of oil represents 80% of CO₂e emissions.

As noted by Judge Jackson, the SCC protocol provides a tool to quantify the costs of these emissions. *See High Country Conservation Advocates*, 52 F.Supp.3d at 1190. By failing to consider the costs of GHG emissions from the Proposed Action, the agency’s analysis effectively assumes a price of carbon that is \$0. *See id.* at 21 (holding that although there is a “wide range of estimates about the social cost of GHG emissions[,] neither the BLM’s economist nor anyone else in the record appears to suggest the cost is as low as \$0 per unit. Yet by deciding not to quantify the costs as all, the agencies effectively zeroed out the cost in its quantitative analysis.”). The agency’s failure to consider the SCC is arbitrary and capricious, and ignores the explicit directive of EO 12866.

An agency must “consider every significant aspect of the environmental impact of a proposed action.” *Baltimore Gas & Elec. Co. v. Natural Resources Defense Council*, 462 U.S. 87, 107 (1983) (quotations and citation omitted). This includes the disclosure of direct, indirect, and cumulative impacts of its actions, including climate change impacts and emissions. 40 C.F.R. § 1508.25(c). The need to evaluate such impacts is bolstered by the fact that “[t]he harms associated with climate change are serious and well recognized,” and environmental changes caused by climate change “have already inflicted significant harms” to many resources around the globe. *Massachusetts v. EPA*, 549 U.S. 497, 521 (2007); *see also id.* at 525 (recognizing “the enormity of the potential consequences associated with manmade climate change.”). Among other things, the agency’s analysis must disclose “the relationship between local short-

potential increases in GHG emissions.”) (citing Sarah E. Light, *NEPA’s Footprint: Information Disclosure as a Quasi-Carbon Tax on Agencies*, 87 Tul. L. Rev. 511, 546 (Feb. 2013)).

³⁶ It is important to note that, although the 2010 IWG SCC protocol did not address methane impacts, the 2013 IWG Technical Update explicitly addresses methane impacts. Thus, it is appropriate to calculate a SCC outcome that takes into account the full CO₂e emissions associated with the proposed leasing.

³⁷ *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *Working Group I Contribution to the IPCC Fifth Assessment Report Climate Change 2013: The Physical Science Basis*, at 8-58 (Table 8.7) (Sept. 2013).

term uses of man's environment and the maintenance and enhancement of long-term productivity[,]” including the “energy requirements and conservation potential of various alternatives and mitigation measures.” 42 U.S.C. § 4332(c); 40 C.F.R. § 1502.16(e). As explained by CEQ, this requires agencies to “analyze total energy costs, including possible hidden or indirect costs, and total energy benefits of proposed actions.” 43 Fed. Reg. 55,978, 55,984 (Nov. 29, 2978); *see also* Executive Order 13514, 74 Fed. Reg. 52,117 (Oct. 5, 2009) (requiring government agencies to disclose emissions information annually from direct and indirect activities). Failing to perform such analysis undermines the agency's decisionmaking process and the assumptions made.

Moreover, BLM measures a planning area GHG emissions against a baseline of national and/or global GHG emissions—thereby marginalizing the Proposed Actions contribution to our climate crisis while concluding the agency is powerless to avoid or mitigate such impacts. CEQ warns against such a comparison, providing:

Government action occurs incrementally, program-by-program and step-by-step, and climate impacts are not attributable to any single action, but are exacerbated by a series of smaller decisions, including decisions made by the government. Therefore, the statement that emissions from a government action or approval represent only a small fraction of global emissions is more a statement about the nature of the climate change challenge, and is not an appropriate basis for deciding whether to consider climate impacts under NEPA. Moreover, these comparisons are not an appropriate method for characterizing the potential impacts associated with a proposed action and its alternatives and mitigation.

CEQ Guidance at 9. CEQ also provides that “[i]t is essential ... that Federal agencies not rely on boilerplate text to avoid meaningful analysis, including consideration of alternatives or mitigation.” *Id.* at 5-6 (citing 40 C.F.R. §§ 1500.2, 1502.2). Indeed, the EPA has also cautioned “against comparing GHG emissions associated with a single project to global GHG emission levels” because it erroneously leads to a conclusion that “on a global scale, emissions are not likely to change” as a result of the project.³⁸ Applying the SCC, as provided above, takes these abstract emissions and places them in concrete, economic terms. It also allows the agency to easily perform the cost-benefit analysis envisioned by EO 12866, as well as BLM's own policy. Specifically, Instruction Memorandum No. 2013-131 (Sept. 18, 2013) is reflective of the BLM's attempt to internalize the costs of such emissions:

All BLM managers and staff are directed to utilize estimates of nonmarket environmental values in NEPA analysis supporting planning and other decision-making where relevant and feasible, in accordance with the attached guidance. At least a qualitative description of the most relevant nonmarket values should be included for the affected environment and the impacts of alternatives in NEPA analyses....

Nonmarket environmental values reflect the benefits individuals attribute to experiences of the environment, uses of natural resources, or the existence of

³⁸ *See Light*, 87 Tul. L. Rev. 511, 546.

particular ecological conditions that do not involve market transactions and therefore lack prices. Examples include the perceived benefits from hiking in a wilderness or fishing for subsistence rather than commercial purposes. The economic methods described in this guidance provide monetary estimates of nonmarket values. Several non-economic, primarily qualitative methods can also be used to characterize the values attributed to places, landscapes, and other environmental features. Guidance on qualitative methods for assessing environmental values, including ethnography, interviews, and surveys, is in preparation.

Ideally, economic analysis for resource management should consider all relevant values, not merely those that are easy to quantify. Utilizing nonmarket values provides a more complete picture of the consequences of a proposed activity than market data alone would allow. The BLM's Land Use Planning Handbook, Appendix D encourages inclusion of information on nonmarket values, but does not provide detail.

The agency simply cannot continue to ignore its obligation to consider the costs of GHG emissions in its decisionmaking, as it has done here.

Nor can the agency tout the benefits of oil and gas development without similarly disclosing the costs. *See* 40 C.F.R. § 1502.23. This type of misleading and one-sided analysis is expressly forbidden. *See Hughes River Watershed Conservancy v. Glickman*, 81 F.3d 437, 446-47 (4th Cir. 1996) (“it is essential that the EIS not be based on misleading economic assumptions”); *Sierra Club v. Sigler*, 695 F.2d 957, 979 (5th Cir. 1983) (agency choosing to “trumpet” an action’s benefits has a duty to disclose its costs).

b. Methane emissions and waste.

The agency must take a hard look, and meaningful action, to address the serious issue of methane (“CH₄”) emissions and waste in the oil and gas production process. Such action must include an estimate of the projected methane emission rates from drilling and production activities authorized by the proposed action, as well as detailed analysis of measures employed to mitigate such emissions.

Methane emission rates can differ quite dramatically from one oil and gas field to the next, and, depending on the type of mitigation and emission controls employed, emissions can range anywhere from 1% to 12% of production.³⁹

³⁹ *See, e.g.,* David T. Allen, et. al., *Measurements of methane emissions at natural gas production sites in the United States*, PNAS (Aug. 19, 2013) (finding emissions as low as 1.5% of production at select sites); Anna Karion, et. al., *Methane emissions estimate from airborne measurements over a western United States gas field*, GEOPHYSICAL RESEARCH LETTERS (Aug. 27, 2013) (finding emissions of 6 to 12 percent, on average, in the Uintah Basin). *See also,* Joe Romm, *Study of Best Fracked Wells Finds Low Methane Emissions But Skips Supper-Emitters*, CLIMATE PROGRESS (September 19, 2013), available at:

Assuming a lower-bound leak rate of 1% – which is approximately one-third lower than the EPA estimate of methane emissions in the Inventory of U.S. GHG Emissions and Sinks: 1990-2011⁴⁰ – methane emissions from gas production by the proposed action could represent a meaningful contribution of emissions over the life of the developed field.⁴¹ Assuming an upper-bound leak rate of 12%, the high end of the rate found in a 2012 study using air sampling over the Uinta Basin,⁴² methane emissions from gas could be truly significant indeed. Although there is substantial variability between the 1% and 12% emission leak rates – and, even without specific data from the proposed action, we can assume leakage somewhere between these two extremes – even at the low end emissions would not be trivial.

Even setting aside the issue of climate change, every ton of methane emitted to the atmosphere from oil and gas development is a ton of natural gas *lost*. Every ton of methane lost to the atmosphere is therefore a ton of natural gas that cannot be used by consumers. Methane lost from federal leases may also not yield royalties otherwise shared between federal, state, and local governments. This lost gas reflects serious inefficiencies in how BLM oil and gas leases are developed. Energy lost from oil and gas production – whether avoidable or unavoidable – reduces the ability of a lease to supply energy, increasing the pressure to drill other lands to supply energy to satisfy demand. 40 C.F.R. §§ 1502.16(e)-(f). In so doing, inefficiencies create indirect and cumulative environmental impacts by increasing the pressure to satisfy demand with new drilling. 40 C.F.R. §§ 1508.7, 1508.8(b).

i. Mineral Leasing Act’s duty to prevent waste.

Citizen Groups, and in particular WELC, have been urging field offices throughout the West to adopt common sense and economical measures to address the issue of fugitive methane waste. The agencies have expansive authority – and, indeed, the responsibility and opportunity – to prevent the waste of oil and gas resources, in particular methane, which is the primary constituent of natural gas. The Mineral Leasing Act of 1920 (“MLA”) provides that “[a]ll leases of lands containing oil or gas ... shall be subject to the condition that the lessee will, in

<http://thinkprogress.org/climate/2013/09/19/2646881/study-fracked-wells-methane-emissions-super-emitters/>. See also GAO-11-34 (2010) at 25 (using a conversion factor of .4045 MMTCO₂e/Bcf for vented gas).

⁴⁰ See U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011* (April 2013).

⁴¹ See U.S. Environmental Protection Agency, *Greenhouse Gas Equivalencies Calculator*, available at: <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>.

⁴² See Brian Maffly, *Uinta Basin gas leakage far worse than most believe*, THE SALT LAKE TRIBUNE (Aug 05, 2013), available at: <http://www.sltrib.com/sltrib/news/56692751-78/basin-carbon-emissions-gas.html.csp> (“Between 6 percent and 12 percent of the Uinta Basin’s natural gas production could be escaping into the atmosphere.”).

conducting his explorations and mining operations, use all reasonable precautions to prevent waste of oil or gas developed in the land....” 30 U.S.C. § 225; *see also* 30 U.S.C. § 187 (“Each lease shall contain...a provision...for the prevention of undue waste....” As the MLA’s legislative history teaches, “conservation through control was the dominant theme of the debates.” *Boesche v. Udall*, 373 U.S. 472, 481 (1963) (citing H.R.Rep. No. 398, 66th Cong., 1st Sess. 12-13; H.R.Rep. No. 1138, 65th Cong., 3d Sess. 19 (“The legislation provided for herein...will [help] prevent waste and other lax methods....”))).

BLM’s implementing regulations, reflecting these provisions, currently provide that “[t]he objective” of its MLA regulations in 43 C.F.R. Subpart 3160 “is to promote the orderly and efficient exploration, development and production of oil and gas.” 43 C.F.R. § 3160.0-4. In part, “orderly and efficient” operations are ensured through unitization or communitization agreements. 43 C.F.R. §§ 3161.2, 3162.2-4(b) (BLM authority to require lessees unitization or communitization agreements); 43 C.F.R. Subpart 3180 (general rules pertaining to drilling unit agreements). Such unit agreements, because they may limit BLM authority in subsequent stages, are therefore important tools for preventing waste. *See William P. Maycock et al.*, 177 IBLA 1, 20-21 (Dec. Int. 2008) (“BLM is not required to analyze an alternative that is [n]ot feasible because it is inconsistent with the basic presumption of the Unit Agreement and BLM cannot legally compel the operator to adopt that alternative under the terms of the Unit Agreement”).

Critically, subpart 3160 specifically requires BLM officials to ensure “that all [oil and gas] operations be conducted in a manner which protects other natural resources and the environmental quality, protects life and property and results in the maximum ultimate recovery of oil and gas with minimum waste and with minimum adverse effect on the ultimate recovery of other mineral resources.” 43 C.F.R. § 3161.2 (emphasis added). The lease owner and or operator is, similarly, charged with “conducting all operations in a manner which ensures the proper handling, measurement, disposition, and site security of leasehold production; which protects other natural resources and environmental quality; which protects life and property; and which results in maximum ultimate economic recovery of oil and gas with minimum waste and with minimum adverse effect on ultimate recovery of other mineral resources.” 43 C.F.R. § 3162.1(a) (emph. added). Waste is defined as “(1) A reduction in the quantity or quality of oil and gas ultimately producible from a reservoir under prudent and proper operations; or (2) avoidable surface loss of oil or gas.” 43 C.F.R. § 3160.0-5. Avoidable losses of oil or gas are currently defined as including venting or flaring without authorization, operator negligence, failure of the operator to take “all reasonable measures to prevent and/or control the loss,” and an operator’s failure to comply with lease terms and regulations, order, notices, and the like. *Id.*

In many respects, we think that BLM’s current rules can be tightened. Regardless, it is clear that BLM’s expansive authority, responsibility, and opportunity to prevent waste must permeate the agency’s full planning and decisionmaking processes for oil and gas. The agency must ensure that any development authorized by the proposed action take advantage of not only proven, often economical technologies and practices to prevent methane waste, but, further, the agency’s tools to ensure the orderly and efficient exploration, development, and production of oil and gas through controls placed on the very scale, pace, and nature of development. Moreover, it is clear that BLM’s authority, responsibility, and opportunity extends to both existing and future oil and gas development. BLM, ultimately, manages the federal – i.e., publicly owned – onshore

oil and gas resource in trust for the American people.

On November 19, 2013, a coalition of over 90 environmental, health, and sporting organizations submitted an open letter to Secretary Jewell of the U.S. Department of Interior and Administrator McCarthy of the U.S. Environmental Protection Agency calling for action to substantially reduce emissions of methane from the oil and gas industry on public and private lands, as well as from offshore oil operations. The coalition called on Secretary Jewell to reduce emissions from oil and gas operations on public lands by updating decades-old BLM rules on waste of mineral resources. Further, we asked Administrator McCarthy to directly regulate methane emissions from the oil and gas industry using existing Clean Air Act authority and to develop nationwide curbs on GHG emissions.

Notably, BLM is currently undertaking federal rulemaking pertaining to Onshore Oil and Gas Order No. 9, Waste Prevention and Use of Produced Oil and Gas for Beneficial Purposes. *See* 43 C.F.R. § 3164.1 (authorizing the Director to issue Onshore Oil and Gas Orders to implement or supplement regulations).

In a statement regarding Order No. 9, the agency provided:

This new order would establish standards to limit the waste of vented and flared gas and to define the appropriate use of oil and gas for beneficial use. This order would, among other things, delineate which activities qualify for beneficial use, minimize the amount of venting and flaring that takes place on oil and gas production facilities on Federal and Indian lands, and establish standards for determining avoidable versus unavoidable losses.

Office of Information and Regulatory Affairs, Unified Agenda and Regulatory Plan, RIN: 1004-AE14. The BLM must consider federal rulemaking on Order No. 9, and the implications that this rule would have on place-based action, such as the FFO January 2017 lease sale, in its planning level decisionmaking.

The Western Environmental Law Center and our partners also recently submitted what we have identified as “Core Principles” that should help guide BLM’s new order, and which are aimed to constructively inform the contours of BLM’s rulemaking process. These Core Principles are incorporated herein, and must also be considered by the FFO when undertaking the lease sale planning process. *See* 40 C.F.R. § 1502.9(c)(1)(ii).

ii. President Obama’s Climate Action Plan and Secretarial Order 3289.

President Obama’s June Climate Action Plan explains that “[c]urbing emissions of methane is critical to our overall effort to address global climate change.” *See* Climate Action Plan at 10. The President’s call for action ties in nicely with BLM’s authority and responsibilities, beyond the MLA, to reduce methane emissions.

The starting point is the Federal Land Policy and Management Act of 1976 (“FLPMA”).

Pursuant to FLPMA, the agencies must manage the public lands:

in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition, that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use.

43 U.S.C. § 1701(a)(8) (emphasis added). The BLM, as a multiple use agency, must also manage the public lands and the oil and natural gas resource to “best meet the present and future needs of the American people” and to ensure that management “takes into account the long-term needs of future generations for...non-renewable resources, including...minerals.” 43 C.F.R. § 1702(c). Put differently, the driving force behind agency-authorized oil and gas development is the long-term, and broad, public interest – not the often short-term, and narrow, interest of oil and gas companies. The agencies duty to prevent waste must account for this driving force.

Here, BLM must ensure that these objectives and duties are adhered to through the completion its NEPA analysis, which must, *inter alia*, “use and observe the principles of multiple use and sustained yield” and “weigh long-term benefits to the public against short-term benefits.” *See* 43 U.S.C. § 1712(c)(1), (7). Thus, the FFO has a substantive duty to consider the enduring legacy of oil and gas development in land management decisionmaking, which is to be balanced against other critical multiple use resource values.

Additionally, the BLM, as an agency within the U.S. Department of Interior, is subject to Secretarial Order 3289 (Dept. Int. Sept. 14, 2009). Secretarial Order 3289, in section 3(a), provides that BLM “must consider and analyze climate change impacts when undertaking long-range planning exercises, setting priorities for scientific research and investigations, developing multi-year management plans, and making major decisions regarding potential use of resources under the Department’s purview.” Section 3(a) of Secretarial Order 3289 also reinstated Secretarial Order 3226 (January 19, 2001). Secretarial Order 3226 commits the Department of the Interior to address climate change through its planning and decisionmaking processes. As the Order explains, “climate change is impacting natural resources that the Department of the Interior (Department) has the responsibility to manage and protect.” Sec. Or. 3226, § 1. The Order therefore “ensures that climate change impacts are taken into account in connection with Department planning and decision making.” *Id.* The Order obligates BLM to “consider and analyze potential climate change impacts” in four situations: (1) “when undertaking long-range planning exercises”; (2) “when setting priorities for scientific research and investigations”; (3) “when developing multi-year management plans, and/or” (4) “when making major decisions regarding the potential utilization of resources under the Department’s purview.” *Id.* § 3. The Order specifically provides that “Departmental activities covered by this Order” include “management plans and activities developed for public lands” and “planning and management activities associated with oil, gas and mineral development on public lands.” *Id.* (emphasis added). BLM’s oil and gas decisions are thus contemplated by and subject to section 3 of the Order.

These authorities and responsibilities can be properly exercised through effective use of NEPA. To comply with NEPA, the BLM must take a hard look at direct, indirect, and cumulative impacts, as discussed above. 40 §§ C.F.R. 1502.16(a), (b); 1508.25(c). In evaluating impacts, the agency must discuss “[e]nergy requirements and conservation potential of various alternatives and mitigation measures,” “[n]atural or depletable resource requirements and conservation potential of various alternatives and mitigation measures,” and “[m]eans to mitigate adverse environmental impacts (if not fully covered under 1502.14(f)).” 40 C.F.R. §§ 1502.16(e), (f), (h).

We emphasize, here, the “heart” of the NEPA process: BLM’s duty to consider “alternatives to the proposed action” and to “study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.” 42 U.S.C. §§ 4332(2)(C)(iii), 4332(2)(E); 40 C.F.R. § 1502.14(a). Alternatives are critical because, “[c]learly, it is pointless to ‘consider’ environmental costs without also seriously considering action to avoid them.” *Calvert Cliffs’ Coordinating Comm., Inc. v. U.S. Atomic Energy Commn.*, 449 F.2d 1109, 1128 (D.C. Cir. 1971). Operating in concert with NEPA’s mandate to address environmental impacts, BLM’s fidelity to alternatives analysis helps “sharply defin[e] the issues and provid[e] a clear basis for choice among options by the decision maker and the public.” 40 C.F.R. § 1502.14. An agency must, accordingly, “[r]igorously explore and objectively evaluate all reasonable alternatives” and specifically “[i]nclude the alternative of no action.” 40 C.F.R. §§ 1502.14(a), (d). Even where impacts are “insignificant,” BLM must still consider alternatives. *Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1229 (9th Cir. 1988) (agency’s duty to consider alternatives “is both independent of, and broader than,” its duty to complete an environmental analysis); *Greater Yellowstone Coalition v. Flowers*, 359 F.3d 1257, 1277 (10th Cir. 2004) (duty to consider alternatives “is ‘operative even if the agency finds no significant environmental impact’”).

iii. Methane mitigation measures should be adopted and analyzed.

There are several widely recognized best management practices (“BMPs”) for mitigating methane emissions that must be considered by BLM in its analysis of the proposed action. We believe that most, if not all of these measures should be considered and adopted, both because they can reduce methane emissions from significant emissions sources and because they have also been shown to have very quick paybacks from the sale of captured methane, even at today’s low gas prices. The most important of these measures include:

- Centralized Liquid Gathering Systems and Liquid Transport Pipelines
- Reduced Emission Completions/Recompletions (green completions)
- Low-Bleed/No-Bleed Pneumatic Devices on all New Wells
- Dehydrator Emissions Controls
- Replace High-bleed Pneumatics with Low-Bleed/No-Bleed or Air-Driven Pneumatic Devices on all Existing Wells; and

- Electric Compression
- Liquids Unloading (using plunger lifts or other deliquification technologies)
- Improved Compressor Wet Seal Maintenance/Replacement with Dry Seals
- Vapor Recovery Units on Storage Vessels
- Pipeline Best Management Practices; and
- Leak Detection and Repair

These and other mitigation measures are included among Best Management Practices that have been identified by BLM, EPA, the State of Colorado, and other organizations, as detailed below.⁴³

Here, BLM has already approved a number of Mancos Shale oil projects in the lower San Juan Basin – specifically in the Lybrook and Counselors areas – which have resulted in significant, un-assessed flaring operations contributing to waste and loss of royalties. BLM has failed to sufficiently analyze these projects, and, in particular, have not explained its rationale for why flaring is needed. BLM would need to take this information forward its NEPA analysis for the January 2017 lease sale to assess the overall lack of infrastructure necessary to handle additional development from the sale, and how the agency plans to mitigate and reduce flaring and waste in this new oil play.

Another area of concern to Citizen Groups is the effectiveness of the mitigation measures adopted to ensure that the methane captured is able to make it to market for sale and the realization of rapid payback. Such considerations must be included in the agency’s NEPA analysis. This includes, *inter alia*, how the agency will require operators on private and public lands to coordinate development to ensure that centralized liquids gathering and treatment investments are made prior to the appraisal and field development phase when production increases dramatically. The agencies should identify and describe the mechanisms they plan to employ to achieve this desirable outcome.

The second issue is how gas (as opposed to liquids) captured by implementation of the mitigation measures will enter sales gas lines and make it to market, as opposed to simply being flared and wasted. Citizen Groups believe that the agencies should spell-out whether all of the gas captured by the mitigation measures adopted is expected to have similar access to a sales line, or whether some or all of it will be sent to flares and wasted. If the latter, Citizen Groups believe that additional mitigation measures should be instituted, comparable to the measure

⁴³ See also BLM, Best Management Practices for Fluid Minerals, available at: http://www.blm.gov/pgdata/etc/medialib/blm/wo/MINERALS__REALTY__AND_RESOURCE__PROTECTION_/bmps.Par.60203.File.dat/WO1_Air%20Resource_BMP_Slideshow%2005-09-2011.pdf.

adopted for liquids, requiring planning and timely development of gas gathering and treatment infrastructure to ensure that GHG emissions are reduced, that revenues from gas sales are maximized for the realization of paybacks for operators, royalty payments for the federal and state governments, and that waste of waste of this important resource is minimized.

Notably, at least one BLM Field Office has already taken pioneering steps to address methane emissions and waste through mandatory mitigation measures at the RMP stage. Specifically, in a joint Land and Resource Management Plan (“LRMP”), BLM: 1610 (CO-933), adopted by BLM Colorado’s Tres Rios Field Office (“TRFO”) and the San Juan National Forest (“SJNF”), the agencies broke new and essential ground in both acknowledging that significant GHG pollution would result from oil and gas development on TRFO lands, and then establishing required methane mitigation standards at the planning stage that will bind future leases and permits to drill to comply with these measures. As provided in the Final EIS for the LRMP:

NEPA analysis is typically conducted for oil and gas leasing and when permits are issued. **This FEIS is the first NEPA analysis where lands that could be made available for lease are identified and stipulated.** In a subsequent analysis stage, when there is a site-specific proposal for development, additional air quality impact analysis would occur. This typically occurs when an application for a permit to drill is submitted. Based on the analysis results, additional mitigation or other equally effective options could be considered to reduce air pollution.

Final EIS at 372 (emphasis added). The TRFO set a new standard by recognizing that the climate change impacts from oil and gas industry activities are cumulative and that methane losses from business-as-usual industry practices at the field office level contribute significantly to climate change and must be mitigated. In the Final EIS, the TRFO also recognized that methane emissions represent waste of a key natural resource that belongs to all U.S. citizens, and the failure to control such waste robs the U.S. and state treasuries of royalty revenues. Accordingly, the TRFO adopted six important methane mitigation measures, which include:

- Centralized Liquid Gathering Systems and Liquid Transport Pipelines
- Reduced Emission Completions/Recompletions (green completions)
- Low-Bleed/No-Bleed Pneumatic Devices on all New Wells
- Dehydrator Emissions Controls
- Replace High-bleed Pneumatics with Low-Bleed/No-Bleed or Air-Driven Pneumatic Devices on all Existing Wells; and
- Electric Compression

Id. at 376.

As the FFO proceeds in the lease sale planning process, it is essential to consider the pioneering action taken by the TRFO. *See* 40 C.F.R. § 1502.9(c)(1)(ii). Historically, the dismissive approach the agency has taken on climate change, and failure to adequately address methane emissions altogether, is plainly incompatible with the climate impacts of oil and gas development. It is incumbent upon the FFO to confront the issues of climate change and methane emissions head-on, which must be accomplished through field office level decisionmaking that is reflective of challenges we face.

Moreover, and in addition to both national rulemaking and precedent-setting action at the local field office level, BLM’s Colorado State Office has recently adopted its Comprehensive Air Resources Protection Protocol (“CARPP”), which, as provided by the agency:

[D]escribes the process and strategies the BLM will use when authorizing activities that have the potential to adversely impact air quality within the state of Colorado. This protocol also outlines specific measures that may be taken to address BLM-approved activities with the potential to cause significant adverse impacts to air resources ... within any planning area []. Further, the purposes of this protocol are to address air quality issues identified by the [BLM], or public scoping, in its analysis of potential impacts on air resources for BLM Colorado [RMPs] and [EIS’]; and clarify the mechanisms and procedures that BLM will use to achieve the air resources goals, objectives, and management actions set forth in BLM Colorado RMPs.

While the BLM Colorado CARPP is not binding on the Farmington Field Office, it nevertheless provides an important state-of-the-art resource to guide the agency’s analysis of GHG mitigation measures applicable to the January 2017 lease sale. In particular, Table V-I identifies Best Management Practices and Air Emission Reduction Strategies for Oil and Gas Development. The CARPP is attached hereto as Exhibit 116, and must be considered by BLM in its decisionmaking regarding the FFO January 2017 lease sale. *See* 40 C.F.R. § 1502.9(c)(1)(ii).

iv. The capture of methane is critical due to its global warming potential.

Ensuring compliance with the agency’s methane waste obligations through proper analysis and documentation in the NEPA process is important: technologies and practices change, and the BLM’s duty to prevent degradation and waste cannot be excused just because the agency apparently lags behind the technological curve. The GAO’s 2010 report noted that BLM’s existing waste prevention guidance – Notice to Lessees and Operators (“NTL”) 4a – was developed in 1980, well before many methane reduction technologies and practices were developed and understood. GAO also found that NTL 4a does not “enumerate the sources that should be reported or specify how they should be estimated.”⁴⁴ Problematically, GAO noted “that [BLM] thought the industry would use venting and flaring technologies if they made economic sense,” a perspective which assumes – wrongly – that markets work perfectly in the

⁴⁴ *See* GAO-11-34 (2010) at 11, 27.

absence of necessary regulatory signals and is belied by the lack of information about the magnitude of methane waste and the documented, if still poorly understood, barriers to the deployment of GHG reduction technologies and practices. *Id.* at 20-33. Compounding the problem, GAO also “found a lack of consistency across BLM field offices regarding their understanding of which intermittent volumes of lost gas should be reported to [the Oil and Gas Operations Report].” *Id.* at 11. BLM, to its credit, conceded: “existing guidance was outdated given current technologies and said that they were planning to update it by the second quarter of 2012.” *Id.* at 27.

Indeed, a Report released by NRDC identified that “[c]apturing currently wasted methane for sale could reduce pollution, enhance air quality, improve human health, conserve energy resources, and bring in more than \$2 billion of additional revenue each year.”⁴⁵ Moreover, the Report further identified ten technically proven, commercially available, and profitable methane emission control technologies that together can capture more than 80 percent of the methane currently going to waste. *Id.* Such technologies must also be considered in BLM’s alternatives analysis.

Preventing GHG pollution and waste is particularly important in the natural gas context, where there is an absence of meaningful lifecycle analysis of the GHG pollution emitted by the production, processing, transmission, distribution, and combustion of natural gas. Although natural gas is often touted as a ‘cleaner’ alternative to dirty coal, recent evidence indicates that this may not, in fact be the case – and, at the least, indicates that we must first take immediate, common sense action to reduce GHG pollution from natural gas before it can be safely relied on as an effective tool to transition to a clean energy economy (a noted priority of this Administration).⁴⁶ A recent report by Climate Central addresses the leak rates estimated by various sources and the impacts of this new information on assertions that natural gas is a cleaner fuel than coal, ultimately concluding that given the losses from oil and gas sources it would be decades before switching electricity generation from coal to natural gas could bring about significant reductions in emissions.⁴⁷

Oil and natural gas systems are the biggest contributor to methane emissions in the United States, accounting for over one quarter of all methane emissions.⁴⁸ In light of serious

⁴⁵ Susan Harvey, et al., *Leaking Profits: The U.S. Oil and Gas Industry Can Reduce Pollution, Conserve Resources, and Make Money by Preventing Methane Waste* (March 2012).

⁴⁶ Robert W. Howarth, *Assessment of the Greenhouse Gas Footprint of Natural Gas from Shale Formations Obtained by High-Volume, Slick-Water Hydraulic Fracturing* (Rev’d. Jan. 26, 2011). See also Robert W. Howarth et al., *Venting and Leaking of Methane from Shale Gas Development: Response to Cathles et al.* (2012); Eric D. Larson, PhD, Climate Central, *Natural Gas and Climate Change* (May 2013).

⁴⁷ See Larson.

⁴⁸ *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011*.

controversy and uncertainties regarding GHG pollution from oil and gas development, the agencies quantitative assessment should account for methane's long-term (100-year) global warming impact and, also, methane's short-term (20-year) warming impact using the latest peer-reviewed science to ensure that potentially significant impacts are not underestimated or ignored. *See* 40 C.F.R. § 1508.27(a) (requiring consideration of “[b]oth short- and long-term effects”).

EPA's GHG Inventory – which BLM has historically relied upon in its analysis – assumes that methane is 21 times as potent as carbon dioxide (“CO₂”) over a 100-year time horizon,⁴⁹ a global warming potential (“GWP”) based on the Intergovernmental Panel on Climate Change's (“IPCC”) Second Assessment Report from 1996.⁵⁰ However, the IPCC recently updated their 100-year GWP for methane, substantially increasing the heat-trapping effect to 36.⁵¹ A Supplementary Information Report (“SIR”), prepared for BLM's oil and gas leasing program in Montana and the Dakotas, further explains that GWP “provides a method to quantify the cumulative effect of multiple GHGs released into the atmosphere by calculating carbon dioxide equivalent (CO₂e) for the GHGs.” SIR at 1-2.⁵² However, substantial questions arise when you calibrate methane's GWP over the 20-year planning and environmental review horizon used in the SIR and, typically, by BLM. *See* SIR at 4-1 thru 4-45 (discussing BLM-derived reasonably foreseeable development potential in each planning area). Over this 20-year time period, the IPCC's new research has calculated that methane's GWP is 87⁵³ – yet another substantial increase from its earlier estimate of 72, which was still over three times as potent as otherwise assumed by the SIR.⁵⁴

However, recent peer-reviewed science demonstrates that gas-aerosol interactions amplify methane's impact such that methane is actually 105 times as potent over a twenty year

⁴⁹ *See* 78 Fed.Reg. 19802, April 2, 2013 (EPA proposal to increase methane's GWP to 25 times CO₂).

⁵⁰ INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *Second Assessment Report* (1996) (attached as Exhibit 52); *see also* U.S. Environmental Protection Agency, *Methane*, available at: <http://www.epa.gov/outreach/scientific.html>.

⁵¹ *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *Working Group I Contribution to the IPCC Fifth Assessment Report Climate Change 2013: The Physical Science Basis*, at 8-58 (Table 8.7) (Sept. 2013).

⁵² BLM, *Climate Change, Supplementary Information Report, Montana, North Dakota and South Dakota* (2010) available at: www.blm.gov/mt/st/en/prog/energy/oil_and_gas/leasing/leasingEAs.html.

⁵³ *See* IPCC *Physical Science Report*.

⁵⁴ *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *Fourth Assessment Report, Working Group I, Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, Ch. 2, p. 212, Table 2.14, available at: www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html.

time period.⁵⁵ This information suggests that the near-term impacts of methane emissions have been significantly underestimated. *See* 40 C.F.R. § 1508.27(a) (requiring consideration of short and long term effects). Further, by extension, BLM has also significantly underestimated the near-term benefits of keeping methane emissions out of the atmosphere. 40 C.F.R. §§ 1502.16(e), (f); *id.* at 1508.27. These estimates are important given the noted importance of near term action to ameliorate climate change – near term action that scientists say should focus, *inter alia*, on preventing the emission of short-lived but potent GHGs like methane while, at the same time, stemming the ongoing increase in the concentration of carbon dioxide.⁵⁶ These uncertainties necessitate analysis. 40 C.F.R. §§ 1508.27(a), (b)(4)-(5).

Additional, serious, yet unaddressed uncertainties pertain to the magnitude of methane pollution from oil and gas emissions sources. As provided in the most recent EPA Inventory of Emissions and Sinks: 1990-2011, “[f]urther research is needed in some cases to improve the accuracy of emission factors used to calculate emissions from a variety of sources;” specifically citing the lack of accuracy in emission factors applied to methane sources.⁵⁷ A lack of data reliability has resulted in notable variation in methane emissions reporting from year to year. For example, in a Technical Support Document (“TSD”) prepared for EPA’s mandatory GHG reporting rule for the oil and gas sector for 2012, EPA determined that several emissions sources were projected to be “significantly underestimated.”⁵⁸ EPA thus provided revised emissions factors for four of the most significant underestimated sources that ranged from ten times higher (for well venting from liquids unloading) to as many as 3,500 and 8,800 times higher (for gas well venting from completions and well workovers of unconventional wells).⁵⁹ When EPA accounted for just these four revisions, it more than doubled the estimated GHG emissions from oil and gas production, from 90.2 million metric tons of CO₂ equivalent (“MMTCO₂e”) to 198.0 MMTCO₂e.⁶⁰ However, these emission estimates are based on an outdated GWP of 21. Using the IPCC’s new 100-year GWP for methane of 34, that is 320.5 MMTCO₂e, and, considering a 20-year GWP of 84, that is 792.0 MMTCO₂e – or, respectively, the equivalent emissions from 90.7 or 224 coal fired power plants that is wasted annually. These upward revisions were based

⁵⁵ Drew Shindell et al., *Improved Attribution of Climate Forcing to Emissions*, SCIENCE 2009 326 (5953), p. 716, available at: www.sciencemag.org/cgi/content/abstract/326/5953/716.

⁵⁶ *See, e.g., Limiting Global Warming: Variety of Efforts Needed Ranging from 'Herculean' to the Readily Actionable, Scientists Say*, SCIENCE DAILY (May 4, 2010), available at: <http://www.sciencedaily.com/releases/2010/05/100503161328.htm>; *see also*, Ramanathan, et. al.

⁵⁷ *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011*, at 1-19.

⁵⁸ U.S. Environmental Protection Agency, *Greenhouse Gas Emissions Reporting From The Petroleum And Natural Gas Industry Background Technical Support Document*, at 8, available at: <http://www.epa.gov/climatechange/emissions/subpart/w.html>.

⁵⁹ *Id.* at 9, Table 1; *see also* *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011*.

⁶⁰ *See* EPA, *GHG Emissions Reporting* at 10, Table 2.

primarily on EPA's choice of data set, here, having replaced Energy Information Administration ("EIA") data with emissions data from an EPA and Gas Research Institute ("GRI") study. In the current year, EPA relied on yet another set of data; this time from an oil and gas industry survey of well data conducted by the American Petroleum Institute ("API") and the American Natural Gas Alliance ("ANGA").⁶¹ The API/ANGA survey was conducted in response to EPA's upward adjustments in the previous GHG inventory, noting that "[i]ndustry was alarmed by the upward adjustment," and focused specifically on emissions from liquids unloading and unconventional gas well completions and workovers.⁶² Overall, the survey found that revising emissions from these two sources alone would reduce EPA oil and gas methane emissions estimates, which resulted in reported oil and gas production emissions at 100 MMTCO₂e pursuant to the EPA's GHG Reporting Program.⁶³

To provide a specific example of these differing data sets, EPA previously used an emissions factor of 3 thousand standard cubic feet ("Mcf") of gas emitted to the atmosphere per well completion in calculating its GHG inventory. EPA determined that this figure was significantly underestimated and that a far more accurate emissions factor was 9,175 Mcf per well.⁶⁴ The API/ANGA study suggested that this emission factor is 9,000 Mcf.⁶⁵ However, these emissions factors are simply broad, generalized estimates for well emissions across the nation, and can vary significantly from one geologic formation to the next. For example, emissions reported in the Piceance Basin are as high as 22,000 Mcf of gas per well.⁶⁶

Despite this variability in methane pollution data, what remains clear is that inefficiencies and leakage in oil and gas production results in a huge amount of avoidable waste and emissions, and, conversely, a great opportunity for the BLM to reduce GHG emissions on our public lands. Many of these uncertainties and underestimates, as EPA has explained, are a result of the fact that emissions factors were "developed prior to the boom in unconventional well drilling (1992) and in the absence of any field data and does not capture the diversity of well completion and workover operations or the variance in emissions that can be expected from different hydrocarbon reservoirs in the country." *Mandatory GHG Reporting Rule*, 75 Fed. Reg. 18608,

⁶¹ *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011*, at 3-63.

⁶² API/ANGA, *Characterizing Pivotal Sources of Methane Emissions from Natural Gas Production: Summary and Analysis of API and ANGA Survey Responses*, Sept. 2012, at 1.

⁶³ See EPA, *Petroleum and Natural Gas Systems: 2011 Data Summary (for 2013 GHG Reporting)*, at 3.

⁶⁴ See EPA, *GHG Emissions Reporting*, attached above as Exhibit 57 at Appendix B at 84-87.

⁶⁵ *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011*, at 3-69.

⁶⁶ See, e.g., EPA, *Natural Gas STAR Program, Recommended Technologies and Practices for Wells*, available at: www.epa.gov/gasstar/tools/recommended.html; see also EPA, *Natural Gas STAR Program, Reduced Emissions Completions*, Oct. 26, 2005, at 14.

18621 (April 12, 2010). These underestimates are also caused by the dispersed nature of oil and gas equipment – rather than a single, easily grasped source, such as a coal-fired power plant, oil and gas production consists of large numbers of wells, tanks, compressor stations, pipelines, and other equipment that, individually, may appear insignificant but, cumulatively, may very well be quite significant. While dispersed, oil and gas development is nonetheless a massive, landscape-scale industrial operation – one that just happens to not have a single roof. BLM, as the agency charged with oversight of onshore oil and gas development, therefore has an opportunity to improve our knowledge base regarding GHG emissions from oil and gas production, providing some measure of clarity to this important issue by taking the requisite “hard look” NEPA analysis as part of its decisionmaking for the proposed action.⁶⁷

Convincing evidence also exists to support the consideration of alternatives that would attach meaningful stipulations to areas open to oil and gas development. As a prime contributor to short-term climate change over the next few decades, methane is a prime target for near-term GHG reductions. In fact, there are many proven technologies and practices already available to reduce significantly the methane emissions from oil and gas operations, further detailed below. These technologies also offer opportunities for significant cost-savings from recovered methane gas. Moreover, new research indicates that tropospheric ozone and black carbon (“BC”) contribute to both degraded air quality and global warming, and that emission control measures can reduce these pollutants using current technology and experience.⁶⁸ Employment of these strategies will annually avoid a substantial number of premature deaths from outdoor air pollution, as well as increase annual crop yields by millions of metric tons due to ozone reductions. Indeed, reducing methane emissions is important not only to better protect the climate, but also to prevent waste of the oil and gas resource itself and the potential loss of economic value, including royalties. BLM should evaluate these technologies, analyzing the benefits of technological implementation versus current agency requirements.

These benefits – as well as the proven, cost-effective technologies and practices that achieve these benefits – are documented by EPA’s “Natural Gas STAR” program, which encourages oil and natural gas companies to cut methane waste to reduce climate pollution and recover value and consolidates the lessons learned from industry for the benefit of other companies and entities with oil and gas responsibilities such as BLM.⁶⁹ EPA has identified well over 100 proven technologies and practices to reduce methane waste from wells, tanks, pipelines, valves, pneumatics, and other equipment and thereby make operations more efficient.⁷⁰ Though

⁶⁷ In this context, the 2010 SIR, while providing a basic literature review of GHG emissions sources, is merely a starting point for BLM’s responsibility to take a hard look at GHG emissions in the context of foreseeable drilling operations in the geologic formations proposed for leasing.

⁶⁸ Drew Shindell, et al., *Simultaneously Mitigating Near-Term Climate Change and Improving Human Health and Food Security*, SCIENCE 2012 335, at 183.

⁶⁹ See generally, EPA, Natural Gas STAR Program, available at: www.epa.gov/gasstar/.

⁷⁰ See EPA, Natural Gas STAR Program, *Recommended Technologies and Practices*, available at: www.epa.gov/gasstar/tools/recommended.html.

underutilized, EPA's Natural Gas STAR suggests the opportunity to dramatically reduce GHG pollution from oil and gas development, *if* its identified technologies and practices were implemented at the proper scale and supported by EPA's sister agencies, such as BLM. For calendar year 2010, EPA estimated that this program avoided 38.1 million tons CO₂ equivalent, and added revenue of nearly \$376 million in natural gas sales (at \$4.00/Mcf) – revenue which translates into additional royalties to federal and state governments for the American public.⁷¹ BLM must identify emission reduction strategies in its NEPA analysis, both to address impacts of the proposed action, as well as to satisfy the requirements of SO 3226, FLPMA, and the MLA.

b. Managing for Community and Ecosystem Resiliency.

Resilience is “an ability to recover from or adjust easily to misfortune or change.” MERRIAM-WEBSTER COLLEGIATE DICTIONARY (11th ed. 2008). In the context of climate change and the many resultant impacts, such as the alteration to the biosphere and impairments to human health, the resiliency of our landscapes and a community's ability to respond and adapt to these changes takes on a new magnitude of importance.

According to experts at the Government Accountability Office (“GAO”), federal land and water resources are vulnerable to a wide range of effects from climate change, some of which are already occurring. These effects include, among others, “(1) physical effects, such as droughts, floods, glacial melting, and sea level rise; (2) biological effects, such as increases in insect and disease infestations, shifts in species distribution, and changes in the timing of natural events; and (3) economic and social effects, such as adverse impacts on tourism, infrastructure, fishing, and other resource uses.”⁷² These growing impacts and the necessity to employ climate mitigation measures to ensure landscape and human resiliency and their ability to adapt and respond to climate change impacts must be considered.

⁷¹ See EPA, Natural Gas STAR Program, *Accomplishments*, available at: www.epa.gov/gasstar/accomplishments/index.html#three . BLM should also take a look at EPA's more detailed program accomplishments to provide a measure of what BLM could itself accomplish, and to understand the nature of the problem and opportunities. Also of interest, for calendar year 2008, EPA estimated that its program avoided 46.3 million tons of CO₂ equivalent, equal to the annual GHG emissions from approximately 6 million homes per year, and added revenue of nearly \$802 million in natural gas sales. To speculate, the calendar year 2009 declines are likely associated with ongoing economic and financial stagnation and the low price of natural gas that has slowed natural gas drilling and production.

⁷² GAO Report, *Climate Change: Agencies Should Develop Guidance for Addressing the Effects on Federal Land and Water Resources* (2007); see also Committee on Environment and Natural Resources, National Science and Technology Council, *Scientific Assessment of the Effects of Global Climate Change on the United States* (2008); Melanie Lenart, et. al. *Global Warming in the Southwest: Projections, Observations, and Impacts* (2007) (describing impacts from temperature rise, drought, floods and impacts to water supply on the southwest).

Beyond mitigating climate change by reducing contributions of GHG pollution to the atmosphere, the BLM can also help promote ecological resiliency and adaptability by reducing external anthropogenic environmental stresses (like coal, oil and gas development) as a way of best positioning public lands, and the communities that rely on those public lands, to withstand what is acknowledged ongoing and intensifying climate change degradation. It is crucial for the BLM to close the gap in their decisionmaking regarding the cumulative contribution of coal, oil and gas development made available in the planning area, particularly given the conflict between such authorization and the agency's responsibility to manage for healthy, resilient ecosystems. Although the BLM has recognized the threat of climate change, the agency's decisionmaking is not reflective of this harm and the agency fails to take the many necessary and meaningful steps to ameliorate the impacts to communities, landscapes, and species.

Moreover, CEQ Guidance requires that agencies address the impacts of climate change on the environmental consequences of a proposed action. As the CEQ Guidance recognizes, “[c]limate change can increase the vulnerability of a resource, ecosystem, human community, or structure, which would then be more susceptible to climate change and other effects and result in a proposed action’s effects being more environmentally damaging.” 77 Fed. Reg. at 77,828. These effects are already occurring and are expected to increase, resulting in shrinking water resources, extreme flooding events, invasion of more combustible non-native plant species, soil erosion, loss of wildlife habitat, and larger, hotter wildfires. These impacts have been catalogued in recent scientific studies by federal agencies, including the National Climate Assessment,⁷³ and highlighted by President Obama. *See* Exec. Order No. 13,653, § 1. As the CEQ Guidance recognizes, “GHGs already in the atmosphere will continue altering the climate system into the future, even with current or future emissions control efforts.” 77 Fed. Reg. at 77,829. In other words, climate change impacts are and will continue to be part of the new normal, and “managing th[o]se risks requires deliberate preparation, close cooperation, and coordinated planning ... to improve climate preparedness and resilience; help safeguard our economy, infrastructure, environment, and natural resources; and provide for the continuity of ... agency operations, services, and programs.” Exec. Order No. 13,653, § 1.

NEPA analyses must account for this reality. While the CEQ Guidance suggests that existing and reasonably foreseeable climate change impacts be considered as part of an agency's hard look at impacts, the guidance must also account for the fact that climate change effects are and will continue to be a key component of the environmental baseline. Agencies are required under NEPA to “describe the environment of the areas to be affected or created by the alternatives under consideration.” 40 C.F.R. § 1502.15. The affected environment discussion sets the “baseline” for the impacts analysis and comparison of alternatives. As the Ninth Circuit has recognized, “without establishing ... baseline conditions ... there is simply no way to determine what effect [an action] will have on the environment, and consequently, no way to comply with NEPA.” *Half Moon Bay Fisherman’s Marketing Ass’n v. Carlucci*, 857 F.2d 505, 510 (9th Cir. 1988) (explaining further that “[t]he concept of a baseline against which to compare predictions of the effects of the proposed action and reasonable alternatives is critical to the NEPA process”).

⁷³ Available at <http://nca2014.globalchange.gov/>.

Excluding climate change effects from the environmental baseline ignores the reality that the impacts of proposed actions must be evaluated based on the already deteriorating, climate-impacted state of the resources, ecosystems, human communities, and structures that will be affected. Accordingly, BLM must clarify that existing and reasonably foreseeable climate change impacts as part of the affected environment in the planning area, which then must be assessed as part of the agency's hard look at impacts, and integrated into *each* of the alternatives, including the no action alternative. Put differently, simply acknowledging climate impacts as part of the affected environment is insufficient. BLM must incorporate that information into their hard look at impacts (e.g., the cumulative impact of climate change, the proposed action, and other past, present, and reasonably foreseeable impacts), in particular to help inform the design and consideration of alternatives and mitigation measures.

Critically, the final guidance should emphasize that agencies may not shirk their responsibility to assess climate change merely because of uncertainties. "Reasonable forecasting and speculation is... implicit in NEPA, and we must reject any attempt by agencies to shirk their responsibilities under NEPA by labelling any and all discussion of future environmental effects as 'crystal ball inquiry.'" *Save Our Ecosystems v. Clark*, 747 F.2d 1240, 1246 n.9 (9th Cir. 1984 (quoting *Scientists' Inst. for Pub. Info., Inc. v. Atomic Energy Comm.*, 481 F.2d 1079, 1092 (D.C. Cir. 1973)). NEPA's hard look merely requires "a reasonably thorough discussion of the significant aspects of the probable environmental consequences" to "foster both informed decision - making and informed public participation." *Ctr. for Biological Diversity v. NHTSA*, 538 F.3d 1172, 1194 (9th Cir. 2008) (quotations and citations omitted). As here, BLM has refused to address the implications of their actions in the context of climate change on the basis of uncertainties, such as the lack of fine-scale modeling, which has led BLM to take short-sighted, arbitrary, and capricious action that does not, in fact, account for climate change.

In this context, and to accurately account for and integrate climate change impacts into the affected environment, hard look, alternatives, and mitigation analysis, BLM should evaluate the relevant resources, ecosystems, or communities for key vulnerabilities as part of the baseline assessment. The vulnerability of ecosystems and communities, as well as the species and physical elements they comprise, depends on their inherent qualities and their ability to change or adapt to address new climatic conditions. For example, the vulnerability of certain species can be affected by the tolerance of individual organisms to the direct effects of climate change, the ability of populations to adapt to those conditions through the expression of genetic variability, and the ability to adjust behaviorally to changes in the ecosystem, such as prey shifts. A vulnerability assessment would examine the species and physical elements of existing ecosystems and determine which elements are sensitive, which are resilient, which have the ability to adapt, and what the likely consequences would be of anticipated changes in climate. Human infrastructure—bridges, roads, buildings, etc.—should be assessed similarly.

Because ecosystems (including the human communities that rest within such ecosystems) are so complex, it is impossible to evaluate the vulnerabilities of every population, species, community, or other element of the system in question. Instead, risk assessment must focus on particular, high-priority elements or "key vulnerabilities." In its 5th Assessment Report, the IPCC suggested the following criteria for identifying key vulnerabilities:

- Exposure of society, community or social-ecological system to climate stressors.
- Importance of vulnerable system(s).
- Limited ability of society, community, or social-ecological systems to cope with and build adaptive capacities or limit the adverse consequences of climate related hazard.
- Persistence of vulnerable conditions and degree of irreversibility of consequences.
- Presence of conditions that make societies highly susceptible to cumulative stressors in complex and multiple-interacting systems.

In other words, key vulnerabilities are likely to occur where the effects of climate change are large and intense, imminent, long lasting, highly probable, irreversible, and likely to limit the distribution of highly valued systems or system elements. BLM should clarify that understanding and assessing these vulnerabilities, based on existing information and tools,⁷⁴ is a key component of the affected environment, hard look at impacts, and the design and consideration of alternatives and mitigation measures.

F. The BLM must take a “hard look” at hydraulic fracturing.

Although advances in oil and gas extraction techniques – namely hydraulic fracturing, or fracking – have undoubtedly resulted in a growth of domestic production, the wisdom of these advances with regard to other resource values and human health is still very much in question.⁷⁵ As described in detail below, there is a wealth of information and reports stressing the dangers of fracking that must be considered in the agency’s subject NEPA analysis. Of course, given the national attention and debate that fracking is generating, significant sources of new information and research are being consistently published warning against the dangers and impacts that fracking can produce, which must also be considered by the agency.

For example, sobering new research shows that chemically concentrated fracking fluids can migrate into groundwater aquifers within a matter of years – directly refuting industry claims that rock layers separating aquifers are impervious to these pollutants.⁷⁶ For years, industry claimed that there has never been a documented case of groundwater contamination from fracking, an assertion that was invalidated by EPA’s research in Pavillion, Wyoming. Indeed, a

⁷⁴ Where there is scientific uncertainty, agencies must satisfy the requirements of 40 C.F.R. § 1502.22.

⁷⁵ See, e.g., A.R. Ingraffea, et. al., *Natural Gas, Hydraulic Fracking and a Bridge to Where?* (April 2011).

⁷⁶ See, Abrahm Lustgarten, *New Study Predicts Frack Fluids can Migrate to Aquifers Within Years*, PROPUBLICA, May 1, 2012; Josh Fox, *The Sky is Pink: Annotated Documents*.

second round of testing in the Pavillion area was recently performed by the U.S. Geological Survey, which supported EPA's preliminary findings that hydraulic fracturing resulted in groundwater contamination.⁷⁷ Even in draft form, the Pavillion Report, as discussed below, and its troubling findings – as well as other evidence of fracking related contamination from around the country – underscore the need for thorough analysis to be performed by the FFO in its NEPA analysis of the January 2017 Lease Sale.

The dangers and impacts of fracking are not only limited to extraction, but can be found at every stage of the production cycle. For example, fracking's waste stream can result in dramatic impacts – requiring onsite waste injection, trucking frack fluids offsite, and in some cases even the direct release of fracking waste into watercourses – the impacts of which can be compounded by ineffective or nonexistent regulation.⁷⁸ As detailed herein, shale gas production itself can be inefficient and wasteful – with practices such as the venting of methane,⁷⁹ and the use of vast quantities of water in the fracking process.⁸⁰ Thus, in addition to being wasteful, these practices can also be quite harmful to human health and the environment.

The wisdom of the natural gas boom is further brought into question by the underlying economics driving domestic growth, with a historically low cost of natural gas and a vast number of approved wells that industry has allowed to expire – all of which questions the imminent need for additional public lands to be made available for oil and gas development, often at the expense of other important resource values at stake in an area. However, a closer look at some of the economics motivating the oil and gas industry's push for greater production reveals sheer industry greed and speculation – driven by huge capital investment and Wall Street profits.⁸¹ These factors cannot be ignored by BLM as it undertakes its NEPA analysis for the proposed January 2017 Lease Sale, and must help to inform the resource values the agency elevates in its minerals management program.

⁷⁷ Peter Wright, et. al., U.S. Geological Survey, *Groundwater-Quality and Quality-Control Data for Two Monitoring Wells near Pavillion, Wyoming*, April and May 2012.

⁷⁸ See Abrahm Lustgarten, *The Trillion Gallon Loophole: Lax Rules for Drillers that Inject Pollutants Into the Earth*, PROPUBLICA, Sept. 20, 2012; Earthworks, *The Crisis in Oil & Gas Regulatory Enforcement*, September 2012.

⁷⁹ Energy Policy Research Foundation, *Lighting up the Prairie: Economic Considerations in Natural Gas Flaring*, Sept. 5, 2012; see also, James Hansen, et. al., *Greenhouse gas growth rates*, PNAS, vol. 101, no. 46, 16109-16114, Sept. 29, 2004 (curtailing methane waste is seen as a “vital contribution toward averting dangerous anthropogenic interference with global climate.”)

⁸⁰ See GAO, *Energy-Water Nexus: Coordinated Federal Approach Needed to Better Manage Energy and Water Tradeoffs* (Sept. 2012); Nicholas Kusnetz, *The Bakken oil play spurs booming business – in water*, High Country News, Sept. 5, 2012.

⁸¹ See Deborah Rogers, *In Their Own Words: Examining Shale Gas Hype*, Energy Policy Forum (April 2012).

a. Fracking Impacts

The potential impacts that may result from hydraulic fracturing are myriad and significant; and include, among others, impacts to water quality and supply, impacts to habitat and wildlife, impacts to human health, as well as impacts on greenhouse gas emissions and air quality.⁸² The New York Times recently uncovered a 1987 U.S. Environmental Protection Agency (“EPA”) report to Congress which found, among other things, that fracking can cause groundwater contamination, and cites as an example a case where hydraulic fracturing fluids contaminated a water well in West Virginia.⁸³ The EPA report was further summarized and reviewed in an Environmental Working Group report.⁸⁴

Fracking fluid is a conglomeration of many highly toxic chemicals and compounds. The Endocrine Disruption Exchange (“TEDX”) has documented nearly 1,000 products energy companies inject into the ground in the process of extracting natural gas. Many of these products contain chemicals that are harmful to human health. According to TEDX:

In the 980 products identified...[for use during natural gas operations], there were a total of 649 chemicals. Specific chemical names and CAS numbers could not be determined for 286 (44%) of the chemicals, therefore, the health effects summary is based on the remaining 362 chemicals with CAS numbers...Over 78% of the chemicals are associated with skin, eye or sensory organ effects, respiratory effects, and gastrointestinal or liver effects. The brain and nervous system can be harmed by 55% of the chemicals. These four health effect categories...are likely to appear immediately or soon after exposure. They include symptoms such as burning eyes, rashes, coughs, sore throats, asthma-like effects, nausea, vomiting, headaches, dizziness, tremors, and convulsions. Other effects, including cancer,

⁸² See, e.g., National Wildlife Federation, *No More Drilling in the Dark: Exposing the Hazards of Natural Gas Production and Protecting America’s Drinking Water and Wildlife Habitats* (2011), available at: <http://www.nwf.org/News-and-Magazines/Media-Center/Reports/Archive/2011/No-More-Drilling-in-the-Dark.aspx>; see also United States Forest Service, Chloride Concentration Gradients in Tank-Stored Hydraulic Fracturing Fluids Following Flowback (Nov. 2010), available at: <http://nrs.fs.fed.us/pubs/38533/> (last visited Dec. 20, 2011).

⁸³ See U.S. Environmental Protection Agency, Report to Congress, *Management of Wastes from the Exploration, Development, and Production of Crude Oil, Natural Gas, and Geothermal Energy* (Dec. 1987), at Ch. IV, Damages Caused by Oil and Gas Operations (attached as Exhibit 78); see also *Drilling Down, Documents: A Case of Fracking Related Contamination*, THE NEW YORK TIMES ONLINE, available at: <http://www.nytimes.com/interactive/us/drilling-down-documents-7.html#document/p1/a27935>.

⁸⁴ See Environmental Working Group, *Cracks in the Façade: 25 Years ago, EPA Linked “Fracking” to Contamination* (Aug. 2011), available at: <http://www.ewg.org/reports/cracks-in-the-facade>.

organ damage, and harm to the endocrine system, may not appear for months or years later. Between 22% and 47% of the chemicals were associated with these possibly longer-term health effects. Forty-eight percent of the chemicals have health effects in the category labeled ‘Other.’ The ‘Other’ category includes such effects as changes in weight, or effects on teeth or bones, for example, *but the most often cited effect in this category is the ability of the chemical to cause death.*⁸⁵ (emphasis added)

A Congressional Report issued in April 2011 reveals that energy companies have injected more than 30 million gallons of diesel fuel or diesel mixed with other fluids into the ground nationwide in the process of fracking to extract natural gas between 2005 and 2009.⁸⁶ In Colorado, 1.3 million gallons of fluids containing diesel fuel was used in fracking natural gas wells.⁸⁷ The EPA has stated that “the use of diesel fuel in fracturing fluids poses the greatest threat” to underground sources of drinking water.⁸⁸ According to Congresswoman Diana DeGette of Colorado, fracking with diesel fuel was done without permits in apparent violation of the Safe Drinking Water Act.⁸⁹

In 2012, a former staffer responsible for investigating and managing groundwater contamination for New York State warned that allowing the controversial hydraulic fracturing practices would lead to contamination of the state’s aquifers and poison its drinking water. In staffer Paul Hetzler’s letter to an upstate New York newspaper, he provided:

⁸⁵ TEDX, *Chemicals In Natural Gas Operations*.

⁸⁶ U.S. CONGRESS, HOUSE OF REPRESENTATIVES, COMMITTEE ON ENERGY AND COMMERCE, *Chemicals Used in Hydraulic Fracturing* (April 2011), at 10; *see also* Memorandum from Chairman Henry A. Waxman and Subcommittee Chairman Edward J. Markey, to Committee on Energy and Commerce, *Examining the Potential Impact of Hydraulic Fracturing* (Feb. 28, 2010).

⁸⁷ Karen Frantz, *States probe use of diesel fuel*, DURANGO HERALD, February 5, 2011, available at: <http://www.durangoherald.com/article/20110206/NEWS01/702069922/-1/s>.

⁸⁸ David O. Williams, *U.S. House probe alleges Halliburton, others illegally used diesel in gas fracking*, COLORADO INDEPENDENT, February 1, 2011, available at: <http://coloradoindependent.com/73593/u-s-house-probe-alleges-halliburton-others-illegally-used-diesel-in-gas-fracking>.

⁸⁹ Letter from U.S. CONGRESS, HOUSE OF REPRESENTATIVES, COMMITTEE ON ENERGY AND COMMERCE, Representatives Henry A. Waxman, Edward J. Markey, & Diana DeGette, to Lisa Jackson, Administrator, U.S. ENVIRONMENTAL PROTECTION AGENCY (Jan. 31, 2011), available at: http://degette.house.gov/index.php?option=com_content&view=article&id=1048:energy-a-commerce-committee-fracking-investigation-reveals-millions-of-gallons-of-diesel-fuel-injected-into-ground-across-us&catid=76:press-releases-&Itemid=227; *see also* Environment News Service, *Toxic Diesel Fuel Used Without Permits in Fracking Operations*, February 4, 2011, available at: <http://www.ens-newswire.com/ens/feb2011/2011-02-04-092.html>.

I'm familiar with the fate and transport of contaminants in fractured media, and let me be clear: hydraulic fracturing as it's practiced today will contaminate our aquifers.

Not *might* contaminate our aquifers. Hydraulic fracturing *will* contaminate New York's aquifers. If you were looking for a way to poison the drinking water supply, here in the north-east you couldn't find a more chillingly effective and thorough method of doing so than with hydraulic fracturing.⁹⁰

Despite the energy industry's explanation that a thick layer of bedrock safely separates the gas-containing rock layer being fractured from ground-water used for drinking and surface water sources, evidence is emerging which warns that contaminants from gas wells are making their way into groundwater. This is particularly important, here, as the target Mancos Shale formation is shallow and less than 1,000 feet from the surface, heightening this risk to an even greater degree. Evidence suggesting contaminants from drilling operations have migrated towards the surface include:

- In March 2004, gas was discovered bubbling up in West Divide Creek and a few nearby ponds in Garfield County. The Colorado Oil and Gas Conservation Commission ("COGCC") took samples of the water and discovered they contained benzene, toluene, and m- & p-xylenes at concentrations of 99, 100, and 17 micrograms per liter (mg/l), respectively. This indicated that the gas seeping into West Divide Creek probably was not biogenic methane gas (gas made by the decomposition of organic matter by methanotrophic bacteria), but rather thermogenic gas. Further testing indicated that the gas seeping into West Divide Creek was thermogenic gas from the Williams Fork Formation where EnCana had been drilling for natural gas.⁹¹ EnCana was subsequently fined \$371,000 as a result of contaminating West Divide Creek.
- The COGCC investigated complaints from Weld County, Colorado that domestic water wells were allegedly contaminated from oil and gas development. The COGCC concluded after investigation that the Ellsworth's well contained a mixture of biogenic and thermogenic

⁹⁰ Karen McVeigh, *Damning New Letter from NY State Insider: 'Hydraulic Fracturing as It's Practiced Today Will Contaminate Our Aquifers,'* THE GUARDIAN, January 6, 2012, available at: http://www.alternet.org/water/153684/damning_new_letter_from_ny_state_insider%3A_%27hydraulic_fracturing_as_it%27s_practiced_today_will_contaminate_our_aquifers%27/.

⁹¹ Colorado Oil and Gas Conservation Commission, *Mamm Creek Gas Field - West Divide Creek Gas Seep – April 14, 2004 Update* (2004), available at: http://cogcc.state.co.us/Library/PiceanceBasin/WestDivide4_14_04summary.htm; see also Margaret Ash, Environmental Protection Supervisor, Colorado Oil and Gas Conservation Commission, *Investigation into Complaint of New Gas Seep, West Divide Creek, 2007-2008*.

methane (from gas drilling operations) that was in part attributable to oil and gas development. Ms. Ellsworth and the operator reached a settlement in that case.⁹²

- In 2007, EPA hydrologists sampled a pristine drinking water aquifer under the Jonah Well Field near Pinedale, Wyoming. They found high levels of benzene, a known carcinogen, in 3 wells and low levels of hydrocarbons in an additional 82 wells (out of the 163 wells sampled).⁹³ These contaminated wells are located in an area stretching across 28 miles in an undisturbed landscape in which the only industry that exists is natural gas extraction.
- In Pavillion, Wyoming, EPA found 11 of 39 water samples collected from domestic wells were contaminated with chemicals linked to local natural gas fracking operations. The EPA found arsenic, methane gas, diesel-fuel-like compounds and metals including copper and vanadium. Of particular concern were compounds called adamantanes – a natural hydrocarbon found in natural gas – and a little-known chemical called 2-butoxyethanol phosphate, or 2-BEp. 2-BEp is closely related to 2-BE, a substance known to be used in fracking fluids.⁹⁴
- Pennsylvania state regulators have uncovered more than 50 cases where methane and other contaminants have exploded out of wells or leaked underground into drinking water supplies.⁹⁵

Known and suspected adverse effects of drilling operations include:

- Garfield County, Colorado, Commissioners recently expressed their health and safety concerns regarding natural gas drilling by stating in a legal filing that, “No agency...can guarantee Garfield County residents that exposures to oil and gas emissions will not produce illness or latent effects, including death.” They cited the cases of three people – Chris Mobaldi, Verna Wilson, and Jose Lara – who died after suffering from drilling-related illnesses in Garfield County.⁹⁶

⁹² Letter from David Neslin, Director, Colorado Oil and Gas Conservation Commission, to Mr. and Mrs. Ellsworth (August 7, 2009).

⁹³ BLM Wyoming News Release, *BLM, Wyoming DEQ Require Test of Water Wells Within the Pinedale Anticline and Jonah Fields* (April 26, 2007), available at: http://www.blm.gov/wy/st/en/info/news_room/2007/04/26pfo-DEQ-BLMwatertests.html.

⁹⁴ See Neslin.

⁹⁵ See Robert B. Jackson, et al., *Increased stray gas abundance in a subset of drinking water wells near Marcellus shale gas extraction*, PNAS, December 17, 2012.

⁹⁶ David O. Williams, *GarCo officials blast state gas drilling rules in case requesting more well density*, THE COLORADO INDEPENDENT, January 19, 2011, available at: <http://coloradoindependent.com/72246/garco-officials-blast-state-gas-drilling-rules-in-case-requesting-more-well-density>.

- In April 2008, a nurse at a hospital in Durango, Colorado, became critically ill and almost died of organ failure as a result of second-hand chemical exposure acquired while treating a drill rig worker who had fracking fluid on his clothes.⁹⁷
- In Texas, which now has approximately 93,000 natural-gas wells, up from around 58,000 a dozen years ago, a hospital system in the six counties with some of the heaviest drilling reported in 2010 a 25 percent asthma rate for young children, more than three times the state rate of about 7 percent.⁹⁸
- A house in Bainbridge, Ohio exploded on November 15, 2007. The Ohio Department of Natural Resources attributed the explosion to a methane leak from a nearby hydraulic fractured well. The faulty cement casing of the well developed a crack allowing methane to seep underground and fill the couple's basement.⁹⁹

Abraham Lustgarten, an investigative reporter with ProPublica, who has won the George Polk Award for Environmental Reporting for his work on the dangers of natural gas drilling, writes:

Dennis Coleman, a leading international geologist and expert on tracking underground migration, says more data must be collected before anyone can say for sure that drilling contaminants have made their way to water or that fracturing is to blame. But Coleman also says there's no reason to think it can't happen. Coleman's Illinois-based company, Isotech Laboratories, has both the government and the oil and gas industry as clients. He says he has seen methane gas seep underground for more than seven miles from its source. If the methane can seep, the theory goes, so can the fluids.¹⁰⁰

⁹⁷ Eric Frankowski, *Gas industry secrets and a nurse's story*, HIGH COUNTRY NEWS, July 28, 2008, available at: <http://www.hcn.org/wotr/gas-industry-secrets-and-a-nurses-story>.

⁹⁸ Ian Urbina, *Regulations Lax as Gas Well's Tainted Waters Hits Rivers*, THE NEW YORK TIMES, February 26, 2011, available at: <http://www.nytimes.com/2011/02/27/us/27gas.html?pagewanted=all>.

⁹⁹ See Ohio Department of Natural Resources, Division of Mineral Resources Management, *Report on the Investigation of the Natural Gas Invasion of Aquifers in Bainbridge Township of Geauga County, Ohio* (September 1, 2008); see also Joan Demirjian, *Insurance company [sues] driller over home explosion*, CHAGRIN VALLEY TIMES, January 7, 2010, available at: <http://www.chagrinvallleytimes.com/NC/0/1571.html>.

¹⁰⁰ Abraham Lustgarten, *Hydrofracked? One Man's Mystery Leads to a Backlash Against Natural Gas Drilling*, PROPUBLICA, February 25, 2011, available at: <http://www.propublica.org/article/hydrofracked-one-mans-mystery-leads-to-a-backlash-against-natural-gas-drill/single>.

However, perhaps the most thorough evidence of groundwater contamination from hydraulic fracturing is found in a newly released EPA draft report investigating ground water contamination near Pavillion, Wyoming (“Pavillion Report”).¹⁰¹ Among its findings, the Pavillion Report provides:

Elevated levels of dissolved methane in domestic wells generally increase in those wells in proximity to gas production wells. Pavillion Report, at xiii.

Detection of high concentrations of benzene, xylenes, gasoline range organics, diesel range organics, and total purgeable hydrocarbons in ground water samples from shallow monitoring wells near pits indicates that pits are a source of shallow ground water contamination in the area of investigation. Pits were used for disposal of drilling cuttings, flowback, and produced water. There are at least 33 pits in the area of investigation. When considered separately, pits represent potential source terms for localized ground water plumes of unknown extent. When considered as whole they represent potential broader contamination of shallow ground water. *Id.* at 33 (emphasis added).

The explanation best fitting the data for the deep monitoring wells is that constituents associated with hydraulic fracturing have been released into the Wind River drinking water aquifer at depths above the current production zone. *Id.* (emphasis added).

Although some natural migration of gas would be expected above a gas field such as Pavillion, data suggest that enhanced migration of gas has occurred to ground water at depths used for domestic water supply and to domestic wells. *Id.* at 37 (emphasis added).

A lines of reasoning approach utilized at this site best supports an explanation that inorganic and organic constituents associated with hydraulic fracturing have contaminated ground water at and below the depth used for domestic water supply.... A lines of evidence approach also indicates that gas production activities have likely enhanced gas migration at and below depths used for domestic water supply and to domestic wells in the area of investigation. *Id.* at 39 (emphasis added).

Although the Pavillion Report is currently released as a “draft,” the EPA has shared preliminary data with, and obtained feedback from, Wyoming state officials, EnCana, Tribes, and Pavillion residents, prior to release. Even in draft form, the Pavillion Report and its troubling findings – as well as other evidence of fracking related contamination from around the country – satisfies the low threshold for consideration of the impacts described therein in the preparation of NEPA analysis for the January 2017 Lease Sale.

¹⁰¹ EPA Draft Report, *Investigation of Ground Water Contamination Near, Pavillion, Wyoming* (Dec. 2011).

Historically, BLM has been dismissive of possible impacts to water quality from hydraulic fracturing. However, given the weight of both new and old evidence documenting the risk of water contamination from gas drilling across the country, BLM's approach is becoming increasingly untenable, in particular given the absence of any scientific analysis that conclusively finds that these documented problems do not exist in the area of the proposed lease sale. Indeed, even an industry report prepared for Gunnison Energy Corporation – a major oil and gas developer – has acknowledged the potential for significant impacts to water resources from fracking.¹⁰² The simple fact of the matter is that natural gas development has the potential for poisoning our water with toxic, hazardous, and carcinogenic chemicals as well as naturally occurring radioactive radium, and BLM must provide a thorough hard look analysis of these potentially significant impacts in its analysis for the January 2017 lease sale.

Recent reporting from New Mexico has acknowledged a proliferation of “frack hits,” or “downhole communication,” where new horizontal drilling for oil is communicating with both historic and active vertical wells.¹⁰³ This is a significant development that could result in well blowouts, contamination of resources, and issues over who is responsible for liabilities and costs of such impacts. BLM has a significant responsibility to include track hits in the EA for the January 2017 Lease Sale.

The bottom line is this – energy companies have told us, ‘Trust us, our fracking ingredients and process for extracting natural gas are harmless.’ We now know they have not been truthful and cannot be trusted. Without implementation of a precautionary approach to these risks, BLM will continue to place the health of our community and our environment at risk.

b. Disclosure Rules

One basic purpose of NEPA is to assure that the public and policy makers are aware in advance of the potential environmental consequences of proposed actions. 40 C.F.R. § 1500.1(a). Furthermore, the presence of uncertain or unknown risks may compel an agency to prepare a more thorough EIS, in lieu of an EA. 40 C.F.R. § 1508.27(b)(5). Currently, there are significant uncertainties about the different chemicals that are being used in hydraulic fracking, though, as mentioned above, it is clear that toxic, hazardous, and carcinogenic chemicals are used throughout the fracking process. Current, disclosure of fracking chemicals, via FracFocus, is insufficient to adequately protect the public from potentially toxic, hazardous, and/or

¹⁰² See Gunnison Energy Corporation, *Analysis of Potential Impacts of Four Exploratory Natural Gas Wells to Water Resources of the South Flank of the Grand Mesa, Delta County, Colorado* (March 2003) at 42, 56.

¹⁰³ See, e.g., Gayathri Vaidyanathan, *In N.M., a sea of ‘frack hits’ may be tilting production*, E&E News, (March 18, 2014) (attached as Exhibit 118); Tina Jensen, *Fracking fluid blows out nearby well*, KQRE (October 19, 2013).

carcinogenic chemicals.¹⁰⁴ In preparing its NEPA analysis for the January 2017 lease sale, BLM must catalogue the substances that will be used or are reasonably likely to be used in fracking on the parcels made available. In order to make this information accessible to the public, BLM should categorize these substances as hazardous, toxic, carcinogenic, or benign.

c. Seismic Impacts

The scientific communities recognition of the relationship between hydraulic fracturing and seismic activity is not new. Indeed, the USGS freely admits, “earthquakes induced by human activity have been documented.”¹⁰⁵ The largest and perhaps most widely known incident to date resulted from fluid injection at the Rocky Mountain Arsenal near Denver, Colorado, in 1967, where an earthquake of magnitude 5.5 followed a series of smaller earthquakes. Further, in a 1990 report studying the incident, the USGS confirmed, “the link between fracking fluid injection and the earlier series of earthquakes was established.”¹⁰⁶

Recently, “[a] northeast Ohio well used to dispose of wastewater from oil and gas drilling almost certainly caused a series of 11 minor quakes in the Youngstown area since last spring, a seismologist investigating the quakes said.”¹⁰⁷ After the latest and largest quake Saturday, December 31, 2011, which registered at 4.0 magnitude, “state officials announced their beliefs that injecting wastewater near a fault line had created enough pressure to cause seismic activity. They said four inactive wells within a five-mile radius of the Youngstown well would remain closed.”¹⁰⁸ As Andy Ware, deputy director of the Ohio Department of Natural Resources, which regulates gas drilling and disposal wells, stated, “the state asked on Friday that injection at the well be halted after analysis of the 10th earthquake, a 2.7-magnitude temblor on Dec. 24, showed

¹⁰⁴ Kate Konschnik *et al.*, *Legal Fractures in Chemical Disclosure Laws: Why the Voluntary Chemical Disclosure Registry FracFocus Fails as a Regulatory Compliance Tool*, Harvard Law School, Envtl. Law Program, Apr. 2013.

¹⁰⁵ See USGS, Earthquakes Hazards Program, FAQs, available at: <http://earthquake.usgs.gov/learn/faq/?categoryID=1&faqID=1>.

¹⁰⁶ Craig Nicholson and Robert Wesson, *Earthquake Hazard Associated with Deep Well Injection – A report to the U.S. Environmental Protection Agency*, U.S. Geological Survey Bulletin 1951 (1990), at 74 (also citing other well-documented examples of seismic activity induced by fluid injection, including: Denver, Colorado; Rangely, Colorado; southern Nebraska; western Alberta and southwestern Ontario, Canada; western New York; New Mexico; and Matsushiro, Japan).

¹⁰⁷ Thomas J. Sheeran, *Ohio Earthquakes Caused by Drilling Wastewater Well, Experts Say*, HUFFINGTON POST, January 2, 2012, available at: http://www.huffingtonpost.com/2012/01/02/ohio-earthquakes-caused-by-wastewater-well-drilling_n_1180094.html.

¹⁰⁸ *Id.*

that it occurred less than 2,000 feet below the well.”¹⁰⁹

The events in Youngstown unfortunately don’t seem to be isolated. “A string of mostly small tremors in Arkansas, Oklahoma, Texas, British Columbia and other shale-gas-producing areas suggest that [fracking] may lead, directly or indirectly, to a dangerous earthquake.”¹¹⁰ The commonality of circumstances suggests that a strong correspondence between seismic activity and development techniques used by the oil and gas industry does indeed exist. For example, “[t]he number and strength of earthquakes in central Arkansas have noticeably dropped since the shutdown of two injection wells in the area.”¹¹¹ Scott Ausbrooks, the Geohazards Supervisor for the Arkansas Geological Survey, provided, “[w]e have definitely noticed a reduction in the number of earthquakes, especially the larger ones. It’s definitely worth noting.”¹¹²

Moreover, the U.S. Geological Survey (“USGS”) has recently released a report that links a series of earthquakes in Oklahoma, in January 2011, to a fracking operation underway there. The USGS determined after analyzing earthquake data that “the character of seismic recordings indicate that they are both shallow and unique.”¹¹³ The report continues, providing: “Our analysis showed that shortly after hydraulic fracturing began small earthquakes started occurring, and more than 50 were identified, of which 43 were large enough to be located. Most of these earthquakes occurred within a 24-hour period after hydraulic fracturing operations had ceased.”¹¹⁴

In August 2011, an earthquake measuring 5.3-magnitude near Trinidad, Colorado, was the largest in more than 40 years.¹¹⁵ However, seismic activity near Trinidad is not new. Indeed, a September 2001 swarm of earthquakes near Trinidad prompted a U.S. Geological Survey investigation. The USGS report provided, “In recent years, a large volume of excess water that is

¹⁰⁹ Henry Fountain, *Disposal Halted at Well After New Quake in Ohio*, THE NEW YORK TIMES, Jan. 1, 2012, available at: <http://www.nytimes.com/2012/01/02/science/earth/youngstown-injection-well-stays-shut-after-earthquake.html?scp=3&sq=fracking%20earthquake&st=cse>.

¹¹⁰ *Id.*

¹¹¹ Sarah Eddington, *Ark. Quakes Decline Since Injection Well Closures*, HUFFINGTON POST, March 14, 2011, available at: <http://www.huffingtonpost.com/huff-wires/20110314/us-arkansas-earthquakes/>.

¹¹² *Id.*

¹¹³ Austin Holland, Oklahoma Geological Survey, *Examination of Possibly Induced Seismicity from Hydraulic Fracturing in Eola Field, Garvin County, Oklahoma* (Aug. 2011), at 1.

¹¹⁴ *Id.*

¹¹⁵ Jordan Steffen, *5.3 quake in Trinidad, Colo., area unnerves regions residents*, DENVER POST, August 24, 2011, available at: http://www.denverpost.com/news/ci_18744329.

produced in conjunction with coal-bed methane gas production has been returned to the subsurface in fluid disposal wells in the area of the earthquake swarm;” and later continues, “Because of the proximity of these disposal wells to the earthquakes, local residents and officials are concerned that the fluid disposal might have triggered the earthquakes.”¹¹⁶ The USGS investigation concluded: “the characteristics of the seismicity and the fluid disposal process do not constitute strong evidence that the seismicity is induced by the fluid disposal, though they do not rule out this possibility.”¹¹⁷

The threat of seismic activity induced from oil and gas development practices must be considered in the BLM’s analysis of the January 2017 lease sale. As noted above, Ohio officials placed a five-mile buffer around waste injection wells. Given the recognized correlation between oil and gas development practices and the inducement of earthquakes, taking such a precautionary approach, here, through required stipulations are prudent and would help stem potential future impacts. At the very least, however, BLM must take a hard look at possible seismicity impacts from the proposed action.

G. The BLM must take a “hard look” at impacts to human health.

As introduced above, emissions from oil and gas development are not limited only to combustion, rather they occur throughout the chain of production – with some of the greatest emissions occurring at the point of extraction. These impacts are a consequence of various stages of oil and gas development – from the drilling and fracking of oil and gas wells, to air quality impacts and the release of hazardous emissions. The FFO must sufficiently address and analyze these impacts in its NEPA analysis.

The implementation of methane waste mitigation technologies, as discussed above, can not only help spur economic benefit, but they can also allay some of the harmful health effects that have come as a consequence of the oil and gas industry boom. Not only do these emissions impact air quality,¹¹⁸ but they also can result in significant increases in ground-level ozone, and, consequently, have a dramatic impact on human health.¹¹⁹ For example, ozone has been shown

¹¹⁶ Mark E. Mermonte, et al., USGS, *Investigation of an Earthquake Swarm Near Trinidad, Colorado, August – October 2001* (2002), available at: <http://pubs.usgs.gov/of/2002/ofr-02-0073/ofr-02-0073.html>.

¹¹⁷ *Id.*

¹¹⁸ See, e.g., Colorado Department of Public Health and Environment, *2010 Air Quality Data Report* (2010).

¹¹⁹ See, e.g., GAO Report, *Oil and Gas: Information on Shale Resources, Development, and Environmental and Public Health Risks* (Sept. 2012); GAO Report, *Unconventional Oil and Gas Development: Key Environmental and Public Health Requirements* (Sept. 2012); Earthworks, *Natural Gas Flowback: How the Texas Natural Gas Boom Affects Health and Safety* (April 2012); Green River Alliance, *Healthy Air Questionnaire Final Report: Clean Air and Healthy Communities* (2011); Lisa McKenzie, Ph.D., et. al., *Human health and risk assessment of air*

to decrease lung function – particularly in adolescents and young adults – as well as increase the risk of death from respiratory causes.¹²⁰

The EPA is currently proposing standards to reduce air pollution from oil and natural gas drilling operations. According to the EPA, the oil and gas industry is “the largest industrial source of emissions of volatile organic compounds (“VOCs”), a group of chemicals that contribute to the formation of ground-level ozone (smog).”¹²¹ Moreover, “[e]xposure to ozone is linked to a wide range of health effects, including aggravated asthma, increased emergency room visits and hospital admissions, and premature death.”¹²² In addition to VOCs, the oil and natural gas industry is also “a significant source of emission of methane,” as well as “[e]missions of air toxics such as benzene, ethylbenzene, and n-hexane,” which are “pollutants known, or suspected of causing cancer and other serious health effects.”¹²³ The EPA reports that the oil and gas industry “emits 2.2 million tons of VOCs, 130,000 tons of air toxics, and 16 million tons of greenhouse gases (methane) each year (40% of all methane emission in the U.S.). The industry is one of the largest sources of VOCs and sulfur dioxide emissions in the United States.”¹²⁴ The rapid development of high volume/horizontal drilling in conjunction with hydraulic fracturing has driven expansion of new sources resulting in increased emissions – a change that requires consideration in the BLM’s January 2017 lease sale analysis. Notably, EPA has, thus far, decided that it will not regulate methane emissions directly, suggesting an important and necessary role for BLM.

Many of the impacts to human health have already been documented in communities subject to industrial scale oil and gas development. For example, in Garfield County, Colorado,

emissions from development of unconventional natural gas resources (Feb. 2012); Lisa McKenzie, Ph.D., Testimony on: *Federal Regulation: Economic, job, and energy security implications of federal hydraulic fracturing regulation*, May 2, 2012; Earthworks, *Gas Patch Roulette: How Shale Gas Development Risks Public Health in Pennsylvania*, October 2012.

¹²⁰ See Ira B. Tager, et. al., *Chronic Exposure to Ambient Ozone and Lung Function in Young Adults*, EPIDEMIOLOGY, Vol. 16, No. 6 (Nov. 2005); Michael Jarrett, Ph.D., et. al., *Long-Term Ozone Exposure and Mortality*, THE NEW ENGLAND JOURNAL OF MEDICINE, 360: 1085-95 (2009)

¹²¹ EPA, *Oil and Natural Gas Pollution Standards: Basic Information, Emissions from the Oil & Natural Gas Industry* (2011), available at: <http://www.epa.gov/airquality/oilandgas/basic.html>; see also Cally Carswell, *Cracking the ozone code – Utah’s gas fields*, HIGH COUNTRY NEWS, Sept. 4, 2012.

¹²² See EPA, *Pollution Standards* (fn. 101).

¹²³ *Id.*

¹²⁴ Letter from American Lung Association, American Public Health Association, American Thoracic Society, Asthma and Allergy Foundation of America, and Trust for America’s Health to Lisa Jackson, Administrator, U.S. Environmental Protection Agency (Nov. 30, 2011), at 4.

residents there have experienced health effects they believe to be caused from oil and gas development. “Community concerns range from mild complaints such as dizziness, nausea, respiratory problems, and eye and skin irritation to more severe concerns including cancer.”¹²⁵ Additionally, the community has “environmental concerns related to noise, odors, dust, and ‘toxic’ chemicals in water and air.”¹²⁶ After a thorough review of ambient air data across Garfield County, ATSDR determined that, “considering both theoretical cancer risks as well as non-cancer health effects and the uncertainties associated with the available data, it is concluded that the exposures to air pollution in Garfield County pose an indeterminate public health hazard for current exposures.”¹²⁷ ATSDR further provided that “estimated theoretical cancer risks and non-cancer hazards for benzene [in the community], which is within the oil and gas development area, appear significantly higher than those in typical urban and rural area, causing some potential concern,” and later concluded that “[t]hese elevated levels are an indicator of the increased potential for health effects related to benzene exposure ... in the oil and gas development area.”¹²⁸

Unfortunately, impacts to human health are not limited only to shale gas emissions, but can result from exposure to chemicals necessary for gas extraction – namely, the hundreds of chemicals used in hydraulic fracturing.¹²⁹ Indeed, “[b]etween 2005 and 2009, the 14 oil and gas service companies [analyzed by Congress] used more than 2,500 hydraulic fracturing products containing 750 chemicals and other components. Overall, these companies used 780 million gallons of hydraulic fracturing products – not including water added at the well site – between 2005 and 2009.”¹³⁰ Chemical components include BTEX compounds – benzene, toluene, xylene, and ethylbenzene – which are hazardous air pollutants and known human carcinogens. As BLM proceeds with the January 2017 lease sale, it must consider the human health impacts associated with these extractive practices.

¹²⁵ U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry (“ATSDR”), *Health Consultation: Garfield County, Public Health Implications of Ambient Air Exposures to Volatile Organic Compounds as Measured in Rural, Urban, and Oil & Gas Development Areas* (2008), at 1.

¹²⁶ *Id.*

¹²⁷ *Id.*

¹²⁸ *Id.*

¹²⁹ See Theo Colborn, et. al., *Comments to the Bureau of Land Management, Uncompahgre Field Office*, THE ENDOCRINE DISRUPTION EXCHANGE, April 20, 2012 (attached as Exhibit 106); Theo Colborn, et. al., *Natural Gas Operations from a Public Health Perspective*, HUMAN AND ECOLOGICAL RISK ASSESSMENT, 17: 1039-1056 (2011).

¹³⁰ UNITED STATES HOUSE OF REPRESENTATIVES, COMMITTEE ON ENERGY AND COMMERCE, *Chemicals Used in Hydraulic Fracturing* (April 2011).

Leading doctors and scientists studying these issues recognize the unknown risks inherent to fracking. “We don’t know the chemicals that are involved, really; we sort of generally know,” Vikas Kapil, chief medical officer at National Center for Environmental Health, part of the U.S. Centers for Disease Control and Prevention, said at a conference on hydraulic fracturing.¹³¹ “We don’t have a great handle on the toxicology of fracking chemicals.”¹³² Christopher Portier, director of the CDC’s National Center for Environmental Health and Agency for Toxic Substances and Disease Registry further provided that “additional studies should examine whether wastewater from wells can harm people or the animals and vegetables they eat.”¹³³ “We do not have enough information to say with certainty whether shale gas drilling poses a threat to public health.”¹³⁴

Indeed, a new study demonstrates that animals, especially livestock, are sensitive to the contaminants released into the environment by drilling and by its cumulative impacts.¹³⁵ Because animals often are exposed continually to air, soil, and groundwater and have more frequent reproductive cycles, animals can be used to monitor potential impacts to human health – they are shale gas drilling’s “canary in the coalmine.” The study evaluated all available fracking-related reports on sick or dying animals. Although secrecy surrounds the fracking industry, “a few ‘natural experiments’ have provided powerful evidence that fracking can harm animals.”¹³⁶ For example:

Two cases involving beef cattle farms inadvertently provided control and experimental groups. In one case, a creek into which wastewater was allegedly dumped was the source of water for 60 head, with the remaining 36 head in the herd kept in other pastures without access to the creek. Of the 60 head that were exposed to the creek water, 21 died and 16 failed to produce calves the following

¹³¹ Alex Wayne, *Fracking Moratorium Urged by U.S. Doctors Until Health Studies Conducted*, BLOOMBERG NEWS, January 9, 2012, available at: <http://www.bloomberg.com/news/2012-01-09/fracking-moratorium-urged-by-u-s-doctors-until-health-studies-conducted.html>.

¹³² *Id.*

¹³³ Alex Wayne and Katarzyna Klimasinska, *Health Effects of Fracking for Natural Gas Need Study, Says CDC Scientist*, BLOOMBERG NEWS, January 4, 2012, available at: <http://www.bloomberg.com/news/2012-01-04/health-effects-of-fracking-for-natural-gas-need-study-says-cdc-scientist.html>.

¹³⁴ *Id.*

¹³⁵ Michelle Bamberger and Robert E. Oswald, *Impacts of Gas Drilling on Human and Animal Health*, NEW SOLUTIONS, VOL. 22(1) 51-77 (2012).

¹³⁶ See Peter Montague, *Why Fracking and Other Disasters Are So Hard to Stop*, HUFFINGTON POST, Jan. 20, 2012, available at: <http://www.huffingtonpost.com/peter-montague/why-fracking-and-other-di b 1218889.html> (last visited Jan. 23, 2012).

spring. Of the 36 that were not exposed, no health problems were observed, and only one cow failed to breed. At another farm, 140 head were exposed when the liner of a wastewater impoundment was allegedly slit, as reported by the farmer, and the fluid drained into the pasture and the pond used as a source of water for the cows. Of those 140 head exposed to the wastewater, approximately 70 died and there was a high incidence of stillborn and stunted calves. The remainder of the herd (60 head) was held in another pasture and did not have access to the wastewater; they showed no health or growth problems. These cases approach the design of a controlled experiment, and strongly implicate wastewater exposure in the death, failure to breed, and reduced growth rate of cattle.¹³⁷

The health problems and uncertainties that proliferate in communities where oil and gas development takes place warrants the further collection of data and research, as contemplated under NEPA, before such development can be made possible through the authorization of development through the January 2017 lease sale. NEPA requires a hard look at these impacts.

H. The BLM must take a “hard look” at impacts to water resources.

a. Groundwater Impacts

The oil and gas development authorized through FFO’s January 2017 lease sale will result in significant potential to contaminate groundwater resources in the planning area. In addition to those impacts to groundwater from hydraulic fracturing, as discussed above, such contamination may result during the following processes: (1) the state of chemical mixing due to spills, leaks, and transportation accidents; (2) during the fracking process due to well malfunctions, migration of fracking fluids or fluids from the fractured formation to aquifers, and mobilization of subsurface materials to aquifers; (3) during flowback due to releases, leakage of on-site storage, and spills from pits (caused by improper construction, maintenance, or closure); and (4) during wastewater disposal due to discharges of wastewater into groundwater, incomplete treatment, and transportation accidents.¹³⁸ Fracking chemicals and wastewater may also contaminate groundwater supplies as a result of illegal dumping.¹³⁹ As discussed above, not all chemical used in fracking have been fully disclosed, but many of those that have been disclosed or discovered are toxic, hazardous, or harmful to human health or welfare. Despite a

¹³⁷ See Bamberger at 60.

¹³⁸ See U.S. Environmental Protection Agency, *Draft Plan to Study the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources* (Feb. 2011).

¹³⁹ Nicholas Kusnetz, *North Dakota’s Oil Boom Brings Damage Along with Prosperity*, PROPUBLICA, July 7, 2012, available at: <http://www.propublica.org/article/the-other-fracking-north-dakotas-oil-boom-brings-damage-along-with-prosperi#>.

general lack of adequate oversight of fracking operations, various instances of water pollution from fracking operations have been documented.¹⁴⁰

Here, in preparing its NEPA analysis of the January 2017 lease sale, BLM must address the direct, indirect, and cumulative impacts to groundwater, 40 C.F.R. § 1508.25(c), giving particular scrutiny to the potential for contamination of groundwater supplies.

b. Surface Water Impacts

i. Antidegradation

Section 303 of the Clean Water Act (“CWA”), 33 U.S.C. § 1313, requires each State to institute comprehensive standards establishing water quality goals for all intrastate waters, and requires that such standards “consist of the designated uses of the navigable waters involved and the water quality criteria for such waters based upon such uses.” 33 U.S.C. § 1313(c)(2)(A). A 1987 amendment to the CWA makes clear that section 303 also contains an “antidegradation policy” – that is, a policy requiring that state standards be sufficient to maintain existing beneficial uses of navigable waters, preventing their further degradation. 33 U.S.C. § 1313(d)(4)(B); *see also PUD No. 1 of Jefferson County v. Washington Dept. of Ecology*, 511 U.S. 700, 705 (1994). Accordingly, EPA’s regulations implementing the CWA require that state water quality standards include “a statewide antidegradation policy” to ensure that “[e]xisting instream water uses and the level of water quality necessary to protect [those] uses [are] maintained and protected.” 40 C.F.R. § 131.12(a)(1). At a minimum, state water quality standards must satisfy these conditions. The CWA also allows States to impose more stringent water quality controls. *See* 33 U.S.C. §§ 1311(b)(1)(C), 1370; *see also* 40 CFR § 131.4(a) (“As recognized by section 510 of the Clean Water Act [33 U.S.C. § 1370], States may develop water quality standards more stringent than required by this regulation”). BLM also holds independent authority to protect water quality above and beyond what the CWA may require or authorize. 43 U.S.C. §§ 1701(a)(8), 1702(c), 1732(b).

The water quality standards that Congress required the States to develop must include three elements: (1) first, each water body must be given a “designated use,” such as recreation or the protection of aquatic life; (2) second, the standards must specify for each body of water the amounts of various pollutants or pollutant parameters that may be present without impairing the designated use; and (3) third, each state must adopt an antidegradation review policy which will allow the State to assess activities that may lower the water quality of the water body. *See American Wildlands v. Browner*, 260 F.3d 1192, 1194 (10th Cir. 2001) (citing 33 U.S.C. § 1313(c)(2)(A) and 40 C.F.R. §§ 130.3, 130.10(d)(4), 131.6, 131.10, 131.11).

In its NEPA analysis, BLM must address whether the development of oil and gas resources in the FFO will affect any high quality waters or whether it will degrade any existing

¹⁴⁰ *See, e.g., id.* (reporting on lack of oversight); Western Organization of Resource Councils, *Gone for Good: Fracking and Water Loss in the West* (2013) at 17-18, 31 (noting lack of state oversight).

uses. BLM may not evade its NEPA duty to consider these impacts by asserting that other agencies may issue discharge permits. 40 C.F.R. §§ 1502.14(f), 1502.16(h). “A non-NEPA document – let alone one prepared and adopted by a state government – cannot satisfy a federal agency’s obligations under NEPA.” *South Fork Band Council of Western Shoshone of Nevada v. U.S. Department of Interior*, 588 F.3d 718, 726 (9th Cir. 2009) (citing *Klamath-Siskiyou Wildlands Center v. BLM*, 387 F.3d 989, 998 (9th Cir. 2004)) (BLM’s argument that it need not consider impacts because a facility operated under a state permit issued pursuant to the Clean Air Act is “without merit”); *Southern Or. Citizens Against Toxic Sprays, Inc. v. Clark*, 720 F.2d 1475 (9th Cir. 1983) (another agency’s consideration of environmental impacts does not relieve BLM of its duty to consider effects; “BLM must assess independently [the impacts]”); *see also Calvert Cliffs’ Coordinating Comm., Inc. v. U. S. Atomic Energy Comm’n*, 449 F.2d 1109, 1123 (D.C. Cir. 1971) (“Certification by another agency that its own environmental standards are satisfied involves an entirely different kind of judgment.”).

ii. Water Quality Standards

Pursuant to CWA section 303(d)(1), 33 U.S.C. § 1313(d)(1), each state is further required to identify those waters that do not meet water quality standards – called the “303(d)(1) list.” For impaired waters identified in the § 303(d)(1) list, the states must establish a total maximum daily load (“TMDL”) for pollutants identified by the EPA. A TMDL specifies the maximum amount of pollutant that can be discharged or loaded into the waters from all combined sources, so as to comply with the subject water quality standards.

CWA section 1323(a) requires federal agencies to comply with state and local water-quality requirements “in the same manner, and to the same extent as any nongovernmental entity.” Congress intended this section to ensure that federal agencies were required to “meet all [water pollution] control requirements as if they were private citizens.” S. REP. NO. 92-414 (1971), *as reprinted in* 1972 U.S.C.C.A.N. 3668, 3734. This provision applies to activities resulting in either “discharge or runoff of pollutants.” 33 U.S.C. § 1323(a).

Accordingly, any activity undertaken by BLM FFO in this area – including the lease of public lands for oil and gas development – may degrade potential “outstanding waters.” Not only is BLM FFO mandated to follow antidegradation and water quality standards under the CWA and state law, but it must also take a NEPA “hard look” at any impacts that may be related to these water quality standards as well.

c. Water Quantity

In addition to impacts on water quality, oil and gas development processes, and particularly fracking, may result in significant impacts on water quantity. To frack a single well one time requires 2-8 million gallons.¹⁴¹ Annually, the EPA estimates that 70-140 billion gallons of water are used to frack wells in the United States – enough to supply drinking water to 40-80

¹⁴¹ J. David Hughes, *Will Natural Gas Fuel America in the 21st Century?*, May 2011, at 23.

cities of 50,000.¹⁴² This massive use of water is of particular concern in states in the interior west, like New Mexico, where water supplies are scarce and already stretched.¹⁴³ Indeed, as the Department of Energy has recognized, “[a]vailable surface water supplies have not increased in 20 years, and groundwater tables and supplies are dropping at an alarming rate.”¹⁴⁴ Because of the chemicals that are added to fracking water, the water may not be reused.¹⁴⁵ Removing water for fracking can stress existing water supplies by lower water tables and dewatering aquifers, decreasing stream flows, and reducing water in surface reservoirs.¹⁴⁶ This can result in changes to water quality, and it can also alter the hydrology of water systems, and it can increase concentrations of pollutants in the water.

There is also potential for the reductions in water quantity to impacts aquatic and riverine species and habitat by affecting water flows and natural river processes: this, in turn, could lead to fish declines, changes to riparian plant communities, and alterations to sediment.¹⁴⁷ Further, because water resources in New Mexico are in many locations stressed or over-allocated, and oil and gas development has already lead to unpermitted and illegal water withdrawals.¹⁴⁸

Here, in its NEPA analysis BLM must closely assess the direct, indirect, and cumulative impacts of lease development on water supplies. 40 C.F.R. §§ 1508.7, 1508.8. This analysis must consider the potential sources of water in the FFO that would be used for oil and gas development, and the impacts of these water withdrawals on water availability for drinking, agriculture, and wildlife. The analysis must further address the impacts to water quantity at different annual, seasonal, monthly, and daily time scales because the impacts of such water withdrawals could be more acute during times, months, and seasons of scarcity. For example, increased withdrawal and irretrievable contamination of waters will be particularly harmful during times – like the present – when much of the state is experiencing drought conditions.¹⁴⁹

IV. The BLM Must Sufficiently Analyze All Reasonable Alternatives.

¹⁴² See EPA Draft Plan at 20.

¹⁴³ See WORC, *Gone for Good*, at 7-8 (noting water scarcity in west and significant water demands of fracking).

¹⁴⁴ U.S. Dep’t of Energy, *Energy Demands on Water Resources: Report to Congress on the Interdependency of Energy and Water*, Dec. 2012, at 12.

¹⁴⁵ See EPA Draft Plan at 20.

¹⁴⁶ *Id.*

¹⁴⁷ Nat’l Parks Conservation Ass’n, *National Parks and Hydraulic Fracturing: Balancing Energy Needs, Nature, and America’s National Heritage* (2013) at 23.

¹⁴⁸ See WORC, *Gone for Good* at 21.

¹⁴⁹ See WORC, *Gone for Good* at 8.

Through the January 2017 lease sale NEPA process, the FFO required to “estimate and display the physical, biological, economic, and social effects of implementing each alternative considered in detail. The estimation of effects shall be guided by the planning criteria and procedures implementing [NEPA].” 43 C.F.R. § 1610.4-6. Incumbent to any NEPA process is a robust analysis of alternatives to the proposed action. Consideration of reasonable alternatives is necessary to ensure that the agency has before it and takes into account all possible approaches to, and potential environmental impacts of, a particular project. NEPA’s alternatives requirement, therefore, ensures that the “most intelligent, optimally beneficial decision will ultimately be made.” *Calvert Cliffs’ Coordinating Comm., Inc. v. U.S. Atomic Energy Comm’n*, 449 F.2d 1109, 1114 (D.C. Cir. 1971).

“[T]he heart” of an environmental analysis under NEPA is the analysis of alternatives to the proposed project, and agencies must evaluate all reasonable alternatives to a proposed action.” *Colorado Environmental Coalition*, 185 F.3d at 1174 (quoting 40 C.F.R. § 1502.14). An agency must gather “information sufficient to permit a reasoned choice of alternatives as far as environmental aspects are concerned.” *Greater Yellowstone*, 359 F.3d at 1277 (citing *Colorado Environmental Coalition*, 185 F.3d at 1174); *see also Holy Cross Wilderness Fund v. Madigan*, 960 F.2d 1515, 1528 (10th Cir. 1992). Thus, agencies must “ensure that the statement contains sufficient discussion of the relevant issues and opposing viewpoints to enable the decisionmaker to take a ‘hard look’ at environmental factors, and to make a reasoned decision.” *Izaak Walton League of America v. Marsh*, 655 F.2d 346, 371 (D.C. Cir.1981) (citing *Kleppe v. Sierra Club*, 427 U.S. 390, 410 n. 21 (1976)).

Of critical importance is that the agency considers an alternative that properly balances the permanent protection of certain critical areas from the pressures of oil and gas development by industry proponents.

The FFO is uniquely empowered to make this determination and, as codified in BLM’s organic act, the Federal Land and Policy Management Act (“FLPMA”) of 1976, 43 U.S.C. § 1701 *et. seq.*, taking such action is part of its mandate. FLPMA’s congressional declaration states:

It is the policy of the United States that ... the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use;

43 U.S.C. § 1701(a)(8) (emphasis added).

Indeed, BLM is duty bound to develop and revise land use plans according to this congressional mandate, so as to “observe the principles of multiple use.” 43 U.S.C. § 1712(c)(1). “Multiple use” means “a combination of balanced and diverse resource uses

that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values.” *Id.* at § 1702(c).

The oil and gas leasing process, undertaken pursuant to FLPMA, requires BLM to engage in the type of planning that is intended to give context to the agency’s multiple use mandate. Accordingly, FLPMA provides specific criteria for land use plan revisions, requiring consideration of things such as: observation of the principles of multiple use and sustained yield; integrated consideration of physical, biological, economic, and other sciences; reliance on public lands resources and other values; consideration of present and future uses of the public lands; consideration of the relative scarcity of resource values; and weighing the long-term benefits to the public against the short-term benefits. *See* 43 U.S.C. § 1712(c)(1)-(9). Consideration of these criteria must drive the agency’s NEPA analysis.

FLPMA does not mandate that every use be accommodated on every piece of land; rather, delicate balancing is required. *See Norton v. S. Utah Wilderness Alliance*, 542 U.S. 55, 58 (2004). “‘Multiple use’ requires management of the public lands and their numerous natural resources so that they can be used for economic, recreational, and scientific purposes without the infliction of permanent damage.” *Public Lands Council v. Babbitt*, 167 F.3d 1287, 1290 (10th Cir. 1999) (citing 43 U.S.C. § 1702 (c)). As held by the Tenth Circuit, “[i]f all the competing demands reflected in FLPMA were focused on one particular piece of public land, in many instances only one set of demands could be satisfied. A parcel of land cannot both be preserved in its natural character and mined.” *Rocky Mtn. Oil & Gas Ass’n v. Watt*, 696 F.2d 734, 738 n. 4 (10th Cir.1982) (quoting *Utah v. Andrus*, 486 F.Supp. 995, 1003 (D.Utah 1979)); *see also* 43 U.S.C. § 1701(a)(8) (stating, as a goal of FLPMA, the necessity to “preserve and protect certain public lands in their natural condition”); *Pub. Lands Council*, 167 F.3d at 1299 (citing § 1701(a)(8)). As further provided by the Tenth Circuit:

BLM’s obligation to manage for multiple use does not mean that development *must* be allowed on [a particular piece of public lands]. Development is a *possible* use, which BLM must weigh against other possible uses – including conservation to protect environmental values, which are best assessed through the NEPA process. Thus, an alternative that closes the [proposed public lands] to development does not necessarily violate the principle of multiple use, and the multiple use provision of FLPMA is not a sufficient reason to exclude more protective alternatives from consideration.

New Mexico ex rel. Richardson, 565 F.3d at 710.

This type of analysis has been absent from the FFO’s analysis of oil and gas leasing and development, which failed to consider, on equal footing, the value of permanent protection and preservation of public lands, along with industry pressure to lease and develop these lands for oil and gas resources. Given current industry pressure to open critical public lands to oil and gas development, it may be appropriate to revisit this decisionmaking in light of the new information and circumstances that BLM is now aware of. *See* 40 C.F.R. § 1502.9 (c).

While certain lands may indeed be appropriate for responsible fossil fuel resource development, it is equally evident that there are lands where other resource values should prevail. FLPMA affords BLM great authority to appropriately balance these competing interests, which expressly includes the responsibility to “preserve and protect certain public lands in their natural condition.” 43 U.S.C. § 1701(a)(8). Moreover, FLPMA further delegates BLM authority to permanently withdraw lands from consideration. *See* 43 U.S.C. § 1714. This ability authorizes the Secretary to “make, modify, extend, or revoke withdrawals.” *Id.* In either event, the FFO cannot management public lands in a manner that prioritizes oil and gas development above the other resource values at stake.

V. FLPMA: Unnecessary and Undue Degradation

Pursuant to the Federal Land Policy and Management Act (“FLPMA”), 43 U.S.C. § 1701 *et seq.*, “[i]n managing the public lands,” the agencies “shall, by regulation or otherwise, take any action necessary to prevent unnecessary or undue degradation of the lands.” 43 U.S.C. § 1732(b). Written in the disjunctive, BLM must prevent degradation that is “unnecessary” and degradation that is “undue.” *Mineral Policy Ctr. v. Norton*, 292 F.Supp.2d 30, 41-43 (D. D.C. 2003). This protective mandate applies to agencies planning and management decisions, and should be considered in light of its overarching mandate that the FFO employ “principles of multiple use and sustained yield.” 43 U.S.C. § 1732(a); *see also, Utah Shared Access Alliance v. Carpenter*, 463 F.3d 1125, 1136 (10th Cir. 2006) (finding that BLM’s authority to prevent degradation is not limited to the RMP planning process). While these obligations are distinct, they are interrelated and highly correlated. The Bureau must balance multiple uses in its management of public lands, including “recreation, range, timber, minerals, watershed, wildlife and fish, and [uses serving] natural scenic, scientific and historical values.” 43 U.S.C. § 1702(c). It must also plan for sustained yield – “control [of] depleting uses over time, so as to ensure a high level of valuable uses in the future.” *Norton v. S. Utah Wilderness Alliance*, 542 U.S. 55, 58, 124 S.Ct. 2373, 159 L.Ed.2d 137 (2004).

“Application of this standard is necessarily context-specific; the words ‘unnecessary’ and ‘undue’ are modifiers requiring nouns to give them meaning, and by the plain terms of the statute, that noun in each case must be whatever actions are causing ‘degradation.’ ” *Theodore Roosevelt Conservation Partnership v. Salazar*, 661 F.3d 66, 76 (D.C. Cir. 2011) (citing *Utah v. Andrus*, 486 F.Supp. 995, 1005 n. 13 (D. Utah 1979) (defining “unnecessary” in the mining context as “that which is not necessary for mining” – or, in this context, “for oil and gas development” – and “undue” as “that which is excessive, improper, immoderate or unwarranted.”)); *see also Colorado Env’t Coalition*, 165 IBLA 221, 229 (2005) (concluding that in the oil and gas context, a finding of “unnecessary or undue degradation” requires a showing “that a lessee’s operations are or were conducted in a manner that does not comply with applicable law or regulations, prudent management and practice, or reasonably available technology, such that the lessee could not undertake the action pursuant to a valid existing right.”).

Here, that action is the oil and gas development authorized by the FFO through the January 2017 lease sale. The inquiry, then, is whether the agency has taken sufficient measures

to prevent degradation unnecessary to, or undue in proportion to, the development the proposed action permits. See *Theodore Roosevelt Conservation Partnership*, 661 F.3d at 76. For example, methane waste and pollution may cause “undue” degradation, even if the activity causing the degradation is “necessary.” Where methane waste and pollution is avoidable, even if in the process of avoiding such emissions lessees or operators incur reasonable economic costs that are consistent with conferred lease rights, it is “unnecessary” degradation. 43 U.S.C. § 1732(b).

Therefore, drilling activities may only go forward as long as unnecessary and undue environmental degradation does not occur. This is a *substantive* requirement, and one that the BLM must define and apply in the context of oil and gas development authorized through the lease sale. In other words, the FFO must define and apply the substantive UUD requirements in the context of the specific resource values at stake.

Further, these UUD requirements are distinct from requirements under NEPA. “A finding that there will not be significant impact [under NEPA] does not mean either that the project has been reviewed for unnecessary and undue degradation or that unnecessary or undue degradation will not occur.” *Ctr. for Biological Diversity*, 623 F.3d at 645 (quoting *Kendall's Concerned Area Residents*, 129 I.B.L.A. 130, 140 (1994)). In the instant case, BLM must specifically account for UUD in its NEPA analysis for the January 2017 lease sale, which is distinct from its compliance under NEPA, and is also actionable on procedural grounds.

VI. Conclusion

The Citizen Groups appreciate your consideration of the information and concerns addressed herein, as well as the information included in the attached exhibits. This information is critical and must be reflected in the agency’s analysis of the January 2017 lease sale.

Should you have any questions, please do not hesitate to contact me.

Sincerely,



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From: rklein@blm.gov
To: [Kyle Tisdel](#)
Cc: [Mark Ames](#)
Subject: Re: Scoping Comments_Farmington January 2017 Lease Sale
Date: Monday, June 20, 2016 5:03:31 PM

Hi Kyle,

This email serves to inform you that we have received your email and attached PDF. Thank you.

Ross Klein | Natural Resource Specialist

Bureau of Land Management
New Mexico State Office
301 Dinosaur Trail
P.O. Box 27115
Santa Fe, NM 87502-0115

Phone: (505) 954-2143
Fax: (505) 954-2136
Email: rklein@blm.gov

www.blm.gov/nm

On Fri, Jun 17, 2016 at 4:30 PM, Kyle Tisdel <tisdel@westernlaw.org> wrote:

Dear Mr. Ames:

Please find the attached scoping comments for the January 2017 oil and gas lease sale, submitted on behalf of San Juan Citizens Alliance, Diné Citizens Against Ruining Our Environment, WildEarth Guardians, Natural Resources Defense Council, Amigos Bravos, Chaco Alliance, and Sierra Club. Should you have any questions please do not hesitate to contact me.

Regards,

Kyle J. Tisdel
Attorney, Climate & Energy Program Director
Western Environmental Law Center
208 Paseo del Pueblo Sur, #602
Taos, New Mexico 87571
Ph: 575.613.8050

tisdel@westernlaw.org

www.westernlaw.org

Defending the West

From: Koski, Amber
Subject: Molen Reef Class I and II
Date: Monday, June 20, 2016 5:15:09 PM
Attachments: [MoleneefclassI_2016.PDF](#)
[15 BLM \(MOAC 15-079\) Molen Class II Project Resaerch Design Outline \(1\).docx](#)
[DOC020 \(1\).PDF](#)

Greetings,

You have been identified as a potential consulting party for the Molen Reef Class I and II. Please find attached letter requesting that you/your organization provide a statement of your interest/expertise to participate as a consulting party as outlined by Section 106 of the National Historic Preservation Act for the Molen Reef Class I and II. We request that you respond within 30 days of this email.

For your review please find attached letter for the proposed class I and class II and research design outline. A copy of the research design will be available for your review by appointment only at the Price Field Office, Price, Utah starting this week.

You/your organization must express their interest in participating as a consulting party prior to review of the research design.

If you have additional questions please feel free to contact me at 435-636-3618, or by electronic mail at akoski@blm.gov.

All the best,

Amber

--

Amber Koski, M.S.
Archaeologist
BLM-Price Field Office
125 South 600 West
Price, Utah 84501

Direct:435.636.3618
Office: 435.636.3600
Fax:435.636.3655
AKOSKI@BLM.GOV



United States Department of the Interior



BUREAU OF LAND MANAGEMENT
Green River District, Price Field Office
125 South 600 West
Price, UT 84501
<http://www.blm.gov/ut/st/en/fo/price.html>

IN REPLY REFER TO:
8100 UTU-1310 (UTG021)

RE: Proposed Class I and Class II for the Molen Reef area

Dear interested stake holder,

The Bureau of Land Management (BLM), Price Field Office (PFO) is currently developing a Class I existing information inventory and a Class II probabilistic field survey for the Molen Reef area. Based on the results of the Class I and Class II, an intensive pedestrian inventory of 500 acres will occur. Because repeated oil and gas lease with drawls have occurred in this area, a special emphasis will be placed on identifying site types and locations sensitive to full field development. In this case, the Class II will focus on identifying areas that may contain a high potential for rock art occurrence. The resulting inventory may be used to assist the BLM with their travel and transportation planning and for fluid mineral leasing, amongst other future planning efforts.

BLM Proposed Area of Potential Effect (APE) and Identification Efforts

Please find attached map for a visual description of the proposed direct and indirect APE for the Molen area.

For your review and comment please find the following enclosures:

- A Class I Inventory and Research Design for a Site Management Model of the Molen Geographic Region, Price Field Office, BLM

If your organization is interested in participating as a consulting party, please respond in writing within thirty days of this notice. Please be sure to include the following information along with your request:

1. Identify one or two individuals that will act as point of contact for the proposed project
2. Define what relevant information or expertise your organization will contribute to this project
3. Define when and how your organization will provide this information to the BLM
4. Consultants should expect to submit all relevant information within thirty days of this notice.

If you have questions regarding this project, please contact Amber Koski at (435) 636-3618, by electronic mail at akoski@blm.gov, or at the address listed above.

We appreciate the efforts of the Utah heritage community in helping BLM to meet its obligations to identify, evaluate, and protect historic properties. Thank you for your continuing assistance in these matters.

Sincerely,



Ahmed Mohsen
Field Manager

Enclosures (1) (outline)

- A Class I Inventory and Research Design for a Site Management Model of the Molen Geographic Region, Price Field Office, BLM

**Class II Probabilistic Field Survey for the
Molen Geographic Region,
Price Field Office,
BLM**

Research Design Outline

Prepared By:

Jody J. Patterson

Prepared For:

Bureau of Land Management
Price Field Office

Prepared Under Contract With:

Bureau of Land Management
Price Field Office

Prepared By:

Montgomery Archaeological Consultants, Inc.
P.O. Box 219
Moab, Utah 84532

MOAC Report No. 15-079

October 5, 2015

United States Department of Interior (FLPMA)
Permit No. 15-UT-60122

A. EXECUTIVE SUMMARY

- 1 *Purpose: To provide the foundation for the cultural resource planning models, the Class II survey and suggested management directions*
- 2 Identify General Questions and Issues
 - a. Define a research direction in consultation with the Field Office archaeologist to make more informed NRHP evaluations and adverse effect determinations (*main purpose of this outline*)
- 3 Identify Gaps in the Present Data
 - a. Where additional pedestrian inventory is needed to cover spatial inventory data gaps or data gaps in the archaeological record for the project area
- 4 Identify Priorities and Strategies for New Inventory
- 5 Identify Relevant CRM options
 - a. What are the areas that are more amenable or of more conflict to oil and gas development?
 - b. Are there areas, sites, or site types that should be identified for heightened levels of management to avoid or minimize direct or indirect effects.

B. RESEARCH DESIGN

- 1 Setting
 - a. Locational Setting
 - i. Geographical location
 1. Topography
 - ii. Physical description of individual ACECs
 1. Topography
 - b. Environmental/Ecological Setting
 - i. Geology
 1. Historical Geology
 2. Physical Geology
 3. Geomorphology
 4. Sediments/Soils
 - ii. Biology
 1. Wildlife
 2. Vegetation
 - iii. Climate
 1. Recent Trends
 2. Paleoclimate
 - iv. Hydrology

1. Springs
2. Seasonal Water
3. Permanent Water
- c. Cultural History/Literature Review
 - i. Paleoindian
 1. Huntington Mammoth
 2. Isolates
 - ii. Archaic
 1. Early
 2. Middle
 3. Late
 4. Terminal
 - a. Confluence
 - iii. Formative
 1. Fremont
 - a. Snake Rock,
 - b. Pediment sites
 - c. Hunting Canyon
 2. Pueblo
 - a. Regional Exchange
 - iv. Late Prehistoric/Protohistoric
 1. Numic
 - v. Historic
 1. Spanish Trail
 2. Settlement
 - vi. Modern Land Use
 1. Agriculture/Ranching
 2. Mining
 3. Oil and Gas
 - 4.
- 2 Existing Data Review
 - a. Previous Projects
 - b. Previous Sites
- 3 Research Questions
 - a. Resource Specific Questions
 - i. What suite of environmental variables best predict the location of rock art sites in the Molen area? Are different variable suites associated with different temporal periods or rock art styles?

- ii. Is there any spatial patterning in the distribution of particular rock art elements, themes, or styles?
 - iii. Are the rock art sites spatially autocorrected with other site types?
 - iv. Are the suites of variables for predicting site location different for sites without rock art?
 - v. Are environmental (e.g., certain rock formations) or cultural (e.g., proximity of rock art to habitation sites) more useful in predicting the location of rock art?
 - b. Site Eligibility Related Domains/Themes (to be determined upon completion of literature review)
 - i. Regional Interaction
 - 1. Research Questions
 - 2. Data Requirements
 - ii. Human Ecodynamics
 - 1. Research Questions
 - 2. Data Requirements
 - iii. Adaptive Systems
 - 1. Research Questions
 - 2. Data Requirements
 - c. Management Related Questions
 - i. How are rock art sites distributed relative to exploitable natural resources that may be developed in the immediate future (oil & gas, coal, etc.)?
 - ii. Are there commonalities between the anticipated location of archaeological sites, particularly rock art, and areas proposed for oil and gas development.
- 4 Cultural Resource Planning Model
 - a. Purpose
 - b. Data
 - i. Existing Site Location Data
 - ii. Initial Environmental Data
 - 1. Distance to Water
 - 2. Slope
 - 3. Aspect
 - 4. Rock Formations
 - 5. Vegetation
 - 6. Sediments/Soils
 - 7. Landscape metrics (?).
 - c. Methods

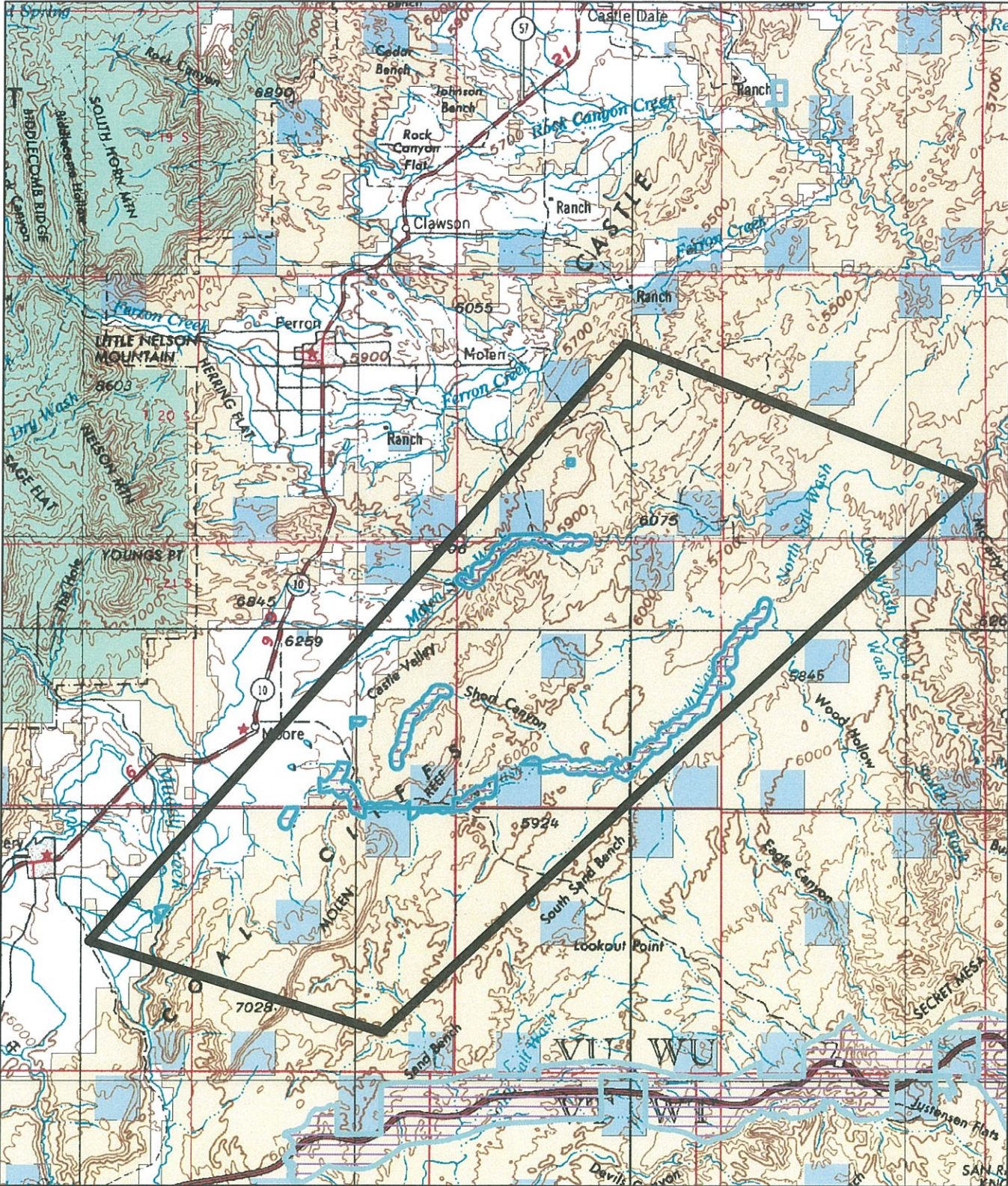
- i. Variable Selection
 - ii. Analytical Techniques
 - 1. Discriminant Analysis (if all data is continuous)
 - 2. Logistical Regression (if ordinal or nominal data is used)
- d. GIS Analyses
 - i. Raster Model Generation/Vector conversions (as necessary or appropriate)
 - ii. Spatial Associations
 - 1. Spatial Patterning
 - 2. Spatial Autocorrelation among various site types
 - iii. Comparison of Site Location Model to Developed Areas (mines ag. fields, towns, etc), ACECs, proposed and Anticipated Development Areas (Chi-square Overlay Analysis)
- e. Results
 - i. Model Results (Classification Results--Random and Leave One Out Classifications)
 - ii. Quantitative Geography and Overlay Results
 - iii. Identification of Survey Gaps
 - iv. Development Conflicts
- f. Class II Inventory- Sample Area Generation (With BLM)
 - i. Sample Strategy (Random, Judgmental, etc).
 - ii. Identify Areas with Significant Survey Gaps.
 - iii. Identify Areas of Potential Conflict

Molen Reef Project Overview

Emery County, Utah

Price Field Office

BLM



Legend

Land Status

- Bureau of Land Management (BLM)
- Private
- State
- US Forest Service (USFS)
- Area of Critical Environmental Concern (ACEC)



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.

PRICE FIELD OFFICE

From: Klein, Ross
To: [My-Linh Le](#)
Cc: [Elly Benson](#); [Michael Saul](#); [Wendy Park](#); [Andrea Weber](#); [BLM NM Lease Sale Comments](#); [Mark Ames](#)
Subject: Re: Center for Biological Diversity & Sierra Club Scoping Comments re Feb 2017 Oil Gas Lease Sale Farmington Field Office
Date: Monday, June 20, 2016 6:38:54 PM
Attachments: [CBD.pdf](#)

Hello My-Linh Le,
This email serves to inform you that we have received your email and attached PDF. Thank you.

Ross Klein | Natural Resource Specialist

Bureau of Land Management
New Mexico State Office
301 Dinosaur Trail
P.O. Box 27115
Santa Fe, NM 87502-0115

Phone: (505) 954-2143
Fax: (505) 954-2136
Email: rklein@blm.gov

www.blm.gov/nm

On Mon, Jun 20, 2016 at 1:39 PM, My-Linh Le <MLLe@biologicaldiversity.org> wrote:

Dear Mr. Klein,

Attached are scoping comments on the Farmington Field Office February 2017 Oil and Gas Lease Sale submitted on behalf of Center for Biological Diversity and Sierra Club. A CD of all references cited in the letter will be delivered to your office via Fed Ex. Thank you for considering our comments.

My-Linh Le

Center for Biological Diversity

1212 Broadway, Suite 800

Oakland, CA 94612

Phone (510) 844-7100

Fax (510) 844-7150

mylle@biologicaldiversity.org <<mailto:aweber@biologicaldiversity.org>>

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*working through science, law and creative media to secure a future for all species,
great or small, hovering on the brink of extinction.*

June 20, 2016

Ross Klein,
Natural Resource Specialist
Bureau of Land Management
P.O. Box 27115
Santa Fe, NM 87502-0115

Via Electronic Mail: rklein@blm.gov and Fed Ex

RE: Scoping Comments for the January 2017 Competitive Oil and Gas Lease Sale, Farmington Field Office

Dear Mr. Klein,

The Center for Biological Diversity and Sierra Club write to submit the following scoping comments on the proposed January 2017 Competitive Oil and Gas Lease Sale, Farmington Field Office (“FFO”).

The Center is a non-profit environmental organization dedicated to the protection of native species and their habitats through science, policy, and environmental law. The Center also works to reduce greenhouse gas emissions to protect biological diversity, our environment, and public health. The Center has over one million members and activists, including those living in New Mexico who have visited these public lands in the FFO for recreational, scientific, educational, and other pursuits and intend to continue to do so in the future, and are particularly interested in protecting the many native, imperiled, and sensitive species and their habitats that may be affected by the proposed oil and gas leasing.

The Sierra Club is a national nonprofit organization of approximately 625,000 members dedicated to exploring, enjoying, and protecting the wild places of the earth; to practicing and promoting the responsible use of the earth’s ecosystems and resources; to educating and enlisting humanity to protect and restore the quality of the natural and human environment; and to using all lawful means to carry out these objectives. The Rio Grande Chapter of the Sierra Club has approximately 7,400 members in the state of New Mexico, including members who live or recreate in the planning area. Sierra Club members use the public lands in New Mexico, including the lands and waters that would be affected by actions under the lease sale, for quiet recreation, scientific research, aesthetic pursuits, and spiritual renewal. These areas would be threatened by increased oil and gas development that could result from the proposed lease sale.

The Bureau of Land Management (“BLM”) received nominations of parcels for the aforementioned sale, which requires the BLM to prepare an Environmental Impact Statement (“EIS”) under the National Environmental Policy Act (“NEPA”). The BLM New Mexico State Office is proposing to offer 4 parcels encompassing approximately 842.66 acres of federal lands in the Rio Arriba and Sandoval Counties (collectively, “planning area”).

Because new fossil fuel leasing within the planning area will contribute to worsening the climate crisis, the vast majority of *all proven* fossil fuels must be kept in the ground to preserve any chance of averting catastrophic climate disruption. Opening up new areas to oil and gas exploration and unlocking new sources of greenhouse gas pollution would only fuel greater warming and contravenes BLM’s mandate to manage the public lands “without permanent impairment of the productivity of the land and the quality of the environment.”¹ Full compliance with the spirit and objectives of NEPA and other federal environmental laws and regulations requires BLM to avoid these dangers by ending all new leasing in the planning area and all other areas that it manages in order to limit the climate change effects of its actions; at a minimum, it should defer any such leasing until such time as it can conduct a comprehensive review of the climate consequences of its leasing activities, at the national and regional scale.

Although BLM’s existing land use plan² mentions some of the potential impacts in very general terms, BLM must also include analyses of all foreseeable site-specific impacts. This includes a re-evaluation of conservation needs and objectives for increasingly scarce and/or fragile natural resources in the areas to be leased. Furthermore, the exploration and development of these parcels likely involves highly controversial and severely harmful extraction methods, including horizontal drilling and hydraulic fracturing (or “fracking”). The existing land use plans do not adequately analyze these relatively new and dangerous “unconventional” extraction methods, or the increased seismic risks from such extraction methods. Given the likelihood that fracking and other similarly harmful techniques would be employed in the exploration and development of the parcels, BLM must analyze and disclose the potential impacts resulting from such frequently used practices, at the lease-parcel scale and across the planning areas. The existing land use, or Resource Management Plan (“RMP”), also fails to properly assess the impacts of leasing on climate change. Proceeding with new leasing and fracking proposals *ad hoc* in the absence of a comprehensive plan that addresses these changed conditions is premature and risks irreversible damage before the agency and public have had the opportunity to weigh the full costs of oil and gas extraction and consider necessary limits on fracking.

The extraction and burning of fossil fuels worsens the climate crisis; endangers water, air, wildlife, public health, and local communities; and further undermines the protection of our public lands. For the reasons set forth in this letter, we insist that BLM: (1) cease all new leasing of fossil fuels in the planning area, including oil and natural gas; or, at a minimum (2) defer the proposed January 2017 Sale pending a programmatic review of all federal fossil fuel leasing which must consider a “no leasing” and “no fracking” plan amendments. Should BLM proceed with the sale, BLM must prepare a full EIS for the proposed lease sale in consideration of

¹ See 43 U.S.C. §§ 1701(a)(7), 1702(c), 1712(c)(1), 1732(a) (emphasis added); *see also id.* § 1732(b) (directing Secretary to take any action to “prevent unnecessary or undue degradation” of the public lands).

² See BLM 2003, Farmington Field Office Resource Management Plan (“2003 FFO RMP”).

significant unexamined impacts from the consequences of leasing. Any such EIS must consider a full range of alternatives, including an alternative that bans new hydraulic fracturing and other unconventional well stimulation activities, and require strict controls on natural gas emissions and leakage.

I. BLM Must End All New Fossil Fuel Leasing and Hydraulic Fracturing.

Climate change is a problem of global proportions resulting from the cumulative greenhouse gas emissions of countless individual sources. A comprehensive look at the impacts of fossil fuel extraction, and especially fracking, across the planning area affected by the leases in an updated RMP is absolutely necessary. BLM has *never* thoroughly considered the cumulative climate change impacts of *all* potential fossil fuel extraction and fracking (1) within the planning area, (2) across the state, and (3) across all public lands. Proceeding with new leasing proposals *ad hoc* in the absence of a comprehensive plan that addresses climate change and fracking is premature and risks irreversible damage before the agency and public have had the opportunity to weigh the full costs of oil and gas and other fossil fuel extraction and consider necessary limits on such activities. Therefore BLM must cease all new leasing at least until the issue is adequately analyzed in a programmatic review of all U.S. fossil fuel leasing, or at least within amended RMPs.

A. BLM Must Limit Greenhouse Gas Emissions By Keeping Federal Fossil Fuels In the Ground

Expansion of fossil fuel production will substantially increase the volume of greenhouse gases emitted into the atmosphere and jeopardize the environment and the health and well being of future generations. BLM's mandate to ensure "harmonious and coordinated management of the various resources *without permanent impairment of the productivity of the land and the quality of the environment*" requires BLM to limit the climate change effects of its actions.³ Keeping all unleased fossil fuels in the ground and banning fracking and other unconventional well stimulation methods would lock away millions of tons of greenhouse gas pollution and limit the destructive effects of these practices.

A ban on new fossil fuel leasing and fracking is necessary to meet the U.S.'s greenhouse gas reduction commitments. On December 12, 2015, 197 nation-state and supra-national organization parties meeting in Paris at the 2015 United Nations Framework Convention on Climate Change Conference of the Parties consented to an agreement (Paris Agreement) committing its parties to take action so as to avoid dangerous climate change.⁴ As the Paris Agreement opens for signature in April 2016⁵ and the United States is expected to sign the

³ See 43 U.S.C. §§ 1701(a)(7), 1702(c), 1712(c)(1), 1732(a) (emphasis added); *see also id.* § 1732(b) (directing Secretary to take any action to "prevent unnecessary or undue degradation" of the public lands).

⁴ United Nations Framework Convention on Climate Change, Adoption of the Paris Agreement, Proposal by the President, Draft decision -/CP.21 (2015) ("Paris Agreement") at Art. 2.

⁵ Paris Agreement, Art. 20(1).

treaty⁶ as a legally binding instrument through executive agreement,⁷ the Paris Agreement commits the United States to critical goals—both binding and aspirational—that mandate bold action on the United States’ domestic policy to rapidly reduce greenhouse gas emissions.⁸

The United States and other parties to the Paris Agreement recognized “the need for an effective and progressive response to the urgent threat of climate change on the basis of the best available scientific knowledge.”⁹ The Paris Agreement articulates the practical steps necessary to obtain its goals: parties including the United States have to “reach global peaking of greenhouse gas emissions *as soon as possible* . . . and to *undertake rapid reductions* thereafter in accordance *with best available science*,”¹⁰ imperatively commanding that developed countries specifically “should continue taking the lead by undertaking economy-wide absolute emission reduction targets”¹¹ and that such actions reflect the “highest possible ambition.”¹²

The Paris Agreement codifies the international consensus that climate change is an “urgent threat” of global concern,¹³ and commits all signatories to achieving a set of global goals. Importantly, the Paris Agreement commits all signatories to an articulated target to hold the long-term global average temperature “to *well below 2°C* above pre-industrial levels and to *pursue efforts to limit the temperature increase to 1.5°C* above pre-industrial levels”¹⁴ (emphasis added).

In light of the severe threats posed by even limited global warming, the Paris Agreement established the international goal of limiting global warming to 1.5°C above pre-industrial levels in order to “prevent dangerous anthropogenic interference with the climate system,” as set forth in the UNFCCC, a treaty which the United States has ratified and to which it is bound.¹⁵ The Paris consensus on a 1.5°C warming goal reflects the findings of the IPCC and numerous scientific studies that indicate that 2°C warming would exceed thresholds for severe, extremely dangerous, and potentially irreversible impacts.¹⁶ Those impacts include increased global food

⁶ For purposes of this Petition, the term “treaty” refers to its international law definition, whereby a treaty is “an international law agreement concluded between states in written form and governed by international law” pursuant to article 2(a) of the Vienna Convention on the Law of Treaties, 1155 U.N.T.S. 331, 8 I.L.M. 679 (Jan. 27, 1980).

⁷ See U.S. Department of State, Background Briefing on the Paris Climate Agreement, (Dec. 12, 2015), <http://www.state.gov/r/pa/prs/ps/2015/12/250592.htm>.

⁸ Although not every provision in the Paris Agreement is legally binding or enforceable, the U.S. and all parties are committed to perform the treaty commitments in good faith under the international legal principle of *pacta sunt servanda* (“agreements must be kept”). Vienna Convention on the Law of Treaties, Art. 26.

⁹ *Id.*, Recitals.

¹⁰ *Id.*, Art. 4(1).

¹¹ *Id.*, Art. 4(4).

¹² *Id.*, Art. 4(3).

¹³ *Id.*, Recitals.

¹⁴ *Id.*, Art. 2.

¹⁵ See U.N. Framework Convention on Climate Change, Cancun Agreement (2011), available at <http://cancun.unfccc.int/> (last visited Jan 7, 2015); United Nations Framework Convention on Climate Change, Copenhagen Accord (2009), available at http://unfccc.int/meetings/copenhagen_dec_2009/items/5262.php (last accessed Jan 7, 2015). The United States Senate ratified the UNFCCC on October 7, 1992. See U.S. Congress, Ratification of Treaty Document titled The United Nations Framework Convention on Climate Change, adopted May 9, 1992 available at <https://www.congress.gov/treaty-document/102nd-congress/38>.

¹⁶ See Paris Agreement, Art. 2(1)(a); U; United Nations Framework Convention on Climate Change, Subsidiary Body for Scientific and Technical Advice, Report on the structured expert dialogue on the 2013-15 review, No.

and water insecurity, the inundation of coastal regions and small island nations by sea level rise and increasing storm surge, complete loss of Arctic summer sea ice, irreversible melting of the Greenland ice sheet, increased extinction risk for at least 20-30% of species on Earth, dieback of the Amazon rainforest, and “rapid and terminal” declines of coral reefs worldwide.¹⁷ As scientists noted, the impacts associated with 2°C temperature rise have been “revised upwards, sufficiently so that 2°C now more appropriately represents the threshold between ‘dangerous’ and ‘extremely dangerous’ climate change.”¹⁸ Consequently, a target of 1.5 °C or less temperature rise is now seen as essential to avoid dangerous climate change and has largely supplanted the 2°C target that had been the focus of most climate literature until recently.

Immediate and aggressive greenhouse gas emissions reductions are necessary to keep warming below a 1.5° or 2°C rise above pre-industrial levels. Put simply, there is only a finite amount of CO₂ that can be released into the atmosphere without rendering the goal of meeting the 1.5°C target virtually impossible. A slightly larger amount could be burned before meeting a 2°C became an impossibility. Globally, extracting and burning all proven fossil fuel reserves would release enough CO₂ to exceed this limit many times over.¹⁹ This is before accounting for unproven resources, such as would be targeted under any new BLM leasing.

The question of what amount of fossil fuels can be extracted and burned without negating a realistic chance of meeting a 1.5 or 2°C target is relatively easy to answer, even if the answer is framed in probabilities and ranges. The IPCC Fifth Assessment Report and other expert assessments have established global carbon budgets, or the total amount of remaining carbon that can be burned while maintain some probability of staying below a given temperature target. According to the IPCC, total cumulative anthropogenic emissions of CO₂ must remain below about 1,000 gigatonnes (GtCO₂) from 2011 onward for a 66% probability of limiting warming to 2°C above pre-industrial levels.²⁰ Given more than 100 GtCO₂ have been emitted since 2011,²¹ the remaining portion of the budget under this scenario is well below 900 GtCO₂. To have an

FCCC/SB/2015/INF.1 at 15-16 (June 2015); Intergovernmental Panel on Climate Change, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change at 64 & Table 2.2 [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)] (“IPCC AR5 Synthesis Report”) at 65 & Box 2.4.

¹⁷ See Jones, C. et al, Committed Terrestrial Ecosystem Changes due to Climate Change, 2 Nature Geoscience 484: 484–487 (2009); Smith, J. B. et al., Assessing Dangerous Climate Change Through an Update of the Intergovernmental Panel on Climate Change (IPCC) ‘Reasons for Concern’, 106 Proceedings of the National Academy of Sciences of the United States of America 4133 (2009); Veron, J. E. N. et al., The Coral Reef Crisis: The Critical Importance of <350 ppm CO₂, 58 Marine Pollution Bulletin 1428, (2009); Warren, R. J. et al., Increasing Impacts of Climate Change Upon Ecosystems with Increasing Global Mean Temperature Rise, 106 Climatic Change 141 (2011); Hare, W. W. et al., Climate Hotspots: Key Vulnerable Regions, Climate Change and Limits to Warming, 11 Regional Environmental Change 1 (2011); Frieler, K. M. et al., Limiting Global Warming to 2°C is Unlikely to Save Most Coral Reefs, Nature Climate Change, Published Online (2013) doi: 10.1038/NCLIMATE1674; Schaeffer, M. et al., Adequacy and Feasibility of the 1.5°C Long-Term Global Limit, Climate Analytics (2013).

¹⁸ Anderson, K. and A. Bows, Beyond ‘Dangerous’ Climate Change: Emission Scenarios for a New World, 369 Philosophical Transactions, Series A, Mathematical, Physical, and Engineering Sciences 20 (2011).

¹⁹ Cimos, Marlene, Keep It In the Ground 6, Sierra Club et al. (Jan. 25, 2016).

²⁰ IPCC, 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change; Summary for Policymakers (2013) at 27; IPCC AR5 Synthesis Report.

²¹ From 2012-2014, 107 GtCO₂ was emitted (see Annual Global Carbon Emissions at <http://co2now.org/Current-CO2/CO2-Now/global-carbon-emissions.html> (accessed May 20, 2016)).

80% probability of staying below the 2°C target, the budget from 2000 is 890 GtCO₂, with less than 430 GtCO₂ remaining.²²

To have even a 50% probability of achieving the Paris Agreement goal of limiting warming to 1.5°C above pre-industrial levels equates to a carbon budget of 550-600 GtCO₂ from 2011 onward,²³ of which more than 100 GtCO₂ has already been emitted. To achieve a 66% probability of limiting warming to 1.5°C requires adherence to a more stringent carbon budget of only 400 GtCO₂ from 2011 onward,²⁴ of which less than 300 GtCO₂ remained at the start of 2015.²⁵ An 80% probability budget for 1.5°C would have far less than 300 GtCO₂ remaining. Given that global CO₂ emissions in 2014 alone totaled 36 GtCO₂,²⁶ humanity is rapidly consuming the remaining burnable carbon budget needed to have even a 50/50 chance of meeting the 1.5°C temperature goal.²⁷

According to a recent report by EcoShift Consulting commissioned by the Center and Friends of the Earth, unleased (and thus unproven and unburnable) federal fossil fuels represent a significant source of potential greenhouse gas emissions:

- Potential GHG emissions of federal fossil fuels (leased and unleased) if developed would release up to 492 gigatons (Gt) (one gigaton equals 1 billion tons) of carbon dioxide equivalent pollution (CO₂e); representing 46 percent to 50 percent of potential emissions from all remaining U.S. fossil fuels.
- Of that amount, up to 450 Gt CO₂e have not yet been leased to private industry for extraction;
- Releasing those 450 Gt CO₂e (the equivalent annual pollution of more than 118,000 coal-fired power plants) would be greater than any proposed U.S. share of global carbon limits that would keep emissions below scientifically advised levels.

Fracking has also opened up vast resources that otherwise would not be available, increasing the potential for future greenhouse gas emissions. In recognition of established

²² Carbon Tracker Initiative, Unburnable Carbon – Are the world’s financial markets carrying a carbon bubble? <http://www.carbontracker.org/wp-content/uploads/2014/09/Unburnable-Carbon-Full-rev2-1.pdf> (accessed May 20, 2016); Meinshausen, M. *et al.*, Greenhouse gas emission targets for limiting global warming to 2 degrees Celsius, 458 *Nature* 1158, 1159 (2009).

²³ IPCC AR5 Synthesis Report at 64 & Table 2.2.

²⁴ *Id.*

²⁵ See CarbonBrief, Carbon Countdown: How Many Years of Current Emissions Would Use up the IPCC’s Carbon Budgets for Different Levels of Warming, <http://www.carbonbrief.org/analysis-only-five-years-left-before-one-point-five-c-budget-is-blown> (accessed May 20, 2016).

²⁶ See Global Carbon Emissions, <http://co2now.org/Current-CO2/CO2-Now/global-carbon-emissions.html>

²⁷ In addition to limits on the *amount* of fossil fuels that can be utilized, emissions pathways compatible with a 1.5 or 2°C target also have a significant temporal element. Leading studies make clear that to reach a reasonable likelihood of stopping warming at 1.5° or even 2°C, global CO₂ emissions must be phased out by mid-century and likely as early as 2040-2045. See, e.g. Rogelj, Joeri *et al.*, Energy system transformations for limiting end-of-century warming to below 1.5°C, 5 *Nature Climate Change* 519, 522 (2015). United States focused studies indicate that we must phase out fossil fuel CO₂ emissions even earlier—between 2025 and 2040—for a reasonable chance of staying below 2°C. See, e.g. Climate Action Tracker, <http://climateactiontracker.org/countries/usa>. Issuing new legal entitlements to explore for and extract federal fossil fuels for decades to come is wholly incompatible with such a transition.

climate science, and global carbon budgeting, BLM must consider a ban on fracking and a ban on new leasing.

Beginning the phase-out of public fossil fuel production by ceasing new onshore leases would have a significant effect on U.S. contributions to greenhouse gas emissions, allowing us to meet targets under the Paris Agreement. The first systematic quantitative assessment of the emissions consequences of a cessation of federal leasing (both onshore and offshore) found that:

[U]nder such a policy, U.S. coal production would steadily decline, moving closer to a pathway consistent with a global 2°C temperature limit. Oil and gas extraction would drop as well, but more gradually, as federal lands and waters represent a smaller fraction of national production, and these resources take longer to develop. Phasing out federal leases for fossil fuel extraction could reduce global CO₂ emissions by 100 million tonnes per year by 2030, and by greater amounts thereafter.²⁸

B. BLM Must Consider A Ban on New Oil and Gas Leasing and Fracking in a Programmatic Review and Halt All New Leasing and Fracking in the Meantime.

Development of unleased oil and gas resources will not only worsen climate disruption, it will undercut the needed transition to a clean energy economy. As BLM has not yet had a chance to consider no leasing and no-fracking alternatives as part of any of its RMP planning processes or a comprehensive review of its federal oil and gas leasing program, BLM should suspend new leasing until it properly considers this alternative in updated RMPs or a programmatic EIS for the entire leasing program. BLM demonstrably has tools available to consider the climate consequences of its leasing programs, and alternatives available to mitigate those consequences, at either a regional or national scale.²⁹

BLM would be remiss to continue leasing when it has never stepped back and taken a hard look at this problem at the programmatic scale. Before allowing more oil and gas extraction in the planning area, BLM must: (1) comprehensively analyze the total greenhouse gas emissions which result from past, present, and potential future fossil fuel leasing and all other activities across all BLM lands and within the various planning areas at issue here, (2) consider their cumulative significance in the context of global climate change, carbon budgets, and other greenhouse gas pollution sources outside BLM lands and the planning area, and (3) formulate measures that avoid or limit their climate change effects. By continuing leasing and allowing new fracking in the absence of any overall plan addressing climate change BLM is effectively burying its head in the sand.

²⁸ Erickson, Peter and Michael Lazarus, How Would Phasing Out U.S. Federal Leases for Fossil Fuel Extraction Affect CO₂ Emissions and 2°C Goals? 1, 31-32, Stockholm Environment Institute Working Paper 2016-02 (May 2016).

²⁹ See, e.g., U.S. Bureau of Land Management Montana, North Dakota and South Dakota, Climate Change Supplementary Information Report (updated Oct. 2010) (conducting GHG inventory for BLM leasing in Montana, North Dakota and South Dakota); U.S. Bureau of Land Management, Proposed Rule: Waste Prevention, Production Subject to Royalties, and Resource Conservation, 81 Fed. Reg. 6615 (Feb. 8, 2016) (proposing BLM-wide rule for prevention of methane waste).

A programmatic review and moratorium on new leasing would be consistent with the Secretary of Interior’s recent order to conduct a comprehensive, programmatic EIS (PEIS) on its coal leasing program, in light of the need to take into account the program’s impacts on climate change, among other issues, and “the lack of any recent analysis of the Federal coal program as a whole.” *See* Secretary of Interior, Order No. 3338, § 4 (Jan. 15, 2016). Specifically, the Secretary directed that the PEIS “should examine how best to assess the climate impacts of continued Federal coal production and combustion and how to address those impacts in the management of the program to meet both the Nation’s energy needs and its climate goals, as well as how best to protect the public lands from climate change impacts.” *Id.* § 4(c).

The Secretary also ordered a moratorium on new coal leasing while such a review is being conducted. The Secretary reasoned:

Lease sales and lease modifications result in lease terms of 20 years and for so long thereafter as coal is produced in commercial quantities. Continuing to conduct lease sales or approve lease modifications during this programmatic review risks locking in for decades the future development of large quantities of coal under current rates and terms that the PEIS may ultimately determine to be less than optimal. This risk is why, during the previous two programmatic reviews, the Department halted most lease sales with limited exceptions. . . . Considering these factors and given the extensive recoverable reserves of Federal coal currently under lease, I have decided that a similar policy is warranted here. A pause on leasing, with limited exceptions, will allow future leasing decisions to benefit from the recommendations that result from the PEIS while minimizing any economic hardship during that review.

Id. § 5.

The Secretary’s reasoning is also apt here. A programmatic review assessing the climate change effects of public fossil fuels is long overdue. And there is no shortage of oil and gas supply that would preclude a moratorium while such a review is conducted, as evidenced by very low natural oil and gas prices. More importantly, BLM should not “risk[] locking in for decades the future development of large quantities of [fossil fuels] under current. . . terms that a [programmatic review] may ultimately determine to be less than optimal.” *Id.* BLM should cancel the sale and halt all new leasing and fracking until a programmatic review is completed.

C. BLM Must Study the Greenhouse Gas Impacts of New Leasing

Social cost of carbon analysis is an appropriate tool for analyzing the cumulative impacts of greenhouse gas emissions. The effects of cumulative greenhouse gas emissions will have far-reaching impacts on natural and social systems. BLM must provide meaningful analysis of the proposed action’s contribution to these effects.

i. The Effects of Cumulative GHG Emissions Will Inflict Extraordinary Harm to Natural Systems and Communities

The Paris Agreement codified the international consensus that the climate crisis is an urgent threat to human societies and the planet, with the parties recognizing that:

Climate change represents an *urgent and potentially irreversible threat to human societies and the planet* and thus requires the widest possible cooperation by all countries, and their participation in an effective and appropriate international response, with a view to accelerating the reduction of global greenhouse gas emissions (emphasis added).³⁰

Numerous authoritative scientific assessments have established that climate change is causing grave harms to human society and natural systems, and these threats are becoming increasingly dangerous. The Intergovernmental Panel on Climate Change (IPCC), in its 2014 Fifth Assessment Report, stated that: “Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased” and that “[r]ecent climate changes have had widespread impacts on human and natural systems.”³¹

The 2014 Third National Climate Assessment, prepared by a panel of non-governmental experts and reviewed by the National Academy of Sciences and multiple federal agencies similarly stated that “[t]hat the planet has warmed is ‘unequivocal,’ and is corroborated through multiple lines of evidence, as is the conclusion that the causes are very likely human in origin”³² and “[i]mpacts related to climate change are already evident in many regions and are expected to become increasingly disruptive across the nation throughout this century and beyond.”³³ The United States National Research Council similarly concluded that: “[c]limate change is occurring, is caused largely by human activities, and poses significant risks for—and in many cases is already affecting—a broad range of human and natural systems.”³⁴

The IPCC and National Climate Assessment further decisively recognize the dominant role of fossil fuels in driving climate change:

While scientists continue to refine projections of the future, observations unequivocally show that climate is changing and that the warming of the past 50 years is primarily due to human-induced emissions of heat-trapping gases. These emissions come mainly from burning coal, oil, and gas, with additional

³⁰ Paris Agreement, Decision, Recitals.

³¹ IPCC AR5 Synthesis Report at 2.

³² Melillo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, Eds., *Climate Change Impacts in the United States: The Third National Climate Assessment* (U.S. Global Change Research Program), doi:10.7930/J0Z31WJ2 (2014) (“Third National Climate Assessment”) at 61 (quoting IPCC, *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, S. Solomon, D. Qin, M. Manning, Z. Chen, M. Marquis, K. B. Averyt, M. Tignor, and H. L. Miller, Eds., Cambridge University Press (2007)).

³³ Third National Climate Assessment at 10.

³⁴ National Research Council, *Advancing the Science of Climate Change* (2010), available at www.nap.edu. (“Advancing the Science of Climate Change”) at 2.

contributions from forest clearing and some agricultural practices.³⁵

CO₂ emissions from fossil fuel combustion and industrial processes contributed about 78% to the total GHG emission increase between 1970 and 2010, with a contribution of similar percentage over the 2000–2010 period (*high confidence*).³⁶

These impacts ultimately emanating from the extraction and combustion of fossil fuels are harming the United States in myriad ways, with the impacts certain to worsen over the coming decades absent deep reductions in domestic and global GHG emissions. EPA recognized these threats in its 2009 Final Endangerment Finding under Clean Air Act Section 202(a), concluding that greenhouse gases from fossil fuel combustion endanger public health and welfare: “the body of scientific evidence compellingly supports [the] finding” that “greenhouse gases in the atmosphere may reasonably be anticipated both to endanger public health and to endanger public welfare.”³⁷ In finding that climate change endangers public health and welfare, EPA has acknowledged the overwhelming evidence of the documented and projected effects of climate change upon the nation:

Effects on air quality: “The evidence concerning adverse air quality impacts provides strong and clear support for an endangerment finding. Increases in ambient ozone are expected to occur over broad areas of the country, and they are expected to increase serious adverse health effects in large population areas that are and may continue to be in nonattainment. The evaluation of the potential risks associated with increases in ozone in attainment areas also supports such a finding.”³⁸

Effects on health from increased temperatures: “The impact on mortality and morbidity associated with increases in average temperatures, which increase the likelihood of heat waves, also provides support for a public health endangerment finding.”³⁹

Increased chance of extreme weather events: “The evidence concerning how human induced climate change may alter extreme weather events also clearly supports a finding of endangerment, given the serious adverse impacts that can result from such events and the increase in risk, even if small, of the occurrence and intensity of events such as hurricanes and floods. Additionally, public health is expected to be adversely affected by an increase in the severity of coastal storm events due to rising sea levels.”⁴⁰

Impacts to water resources: “Water resources across large areas of the country are at serious risk from climate change, with effects on water supplies, water quality, and adverse effects from extreme events such as floods and droughts. Even areas of the country where an

³⁵ Third National Climate Assessment at 2.

³⁶ IPCC AR5 Synthesis Report at 46.

³⁷ U.S. Environmental Protection Agency, Endangerment and Cause or Contribute Findings for Greenhouse Gas Unders Section 202(a) of the Clean Air Act, 74 Fed. Reg. at 66,497 (Dec 15, 2009) (“Final Endangerment Finding”).

³⁸ *Id.*

³⁹ *Id.*

⁴⁰ *Id.* at 66,497-98.

increase in water flow is projected could face water resource problems from the supply and water quality problems associated with temperature increases and precipitation variability, as well as the increased risk of serious adverse effects from extreme events, such as floods and drought. The severity of risks and impacts is likely to increase over time with accumulating greenhouse gas concentrations and associated temperature increases.”⁴¹

Impacts from sea level rise: “The most serious potential adverse effects are the increased risk of storm surge and flooding in coastal areas from sea level rise and more intense storms. Observed sea level rise is already increasing the risk of storm surge and flooding in some coastal areas. The conclusion in the assessment literature that there is the potential for hurricanes to become more intense (and even some evidence that Atlantic hurricanes have already become more intense) reinforces the judgment that coastal communities are now endangered by human-induced climate change, and may face substantially greater risk in the future. Even if there is a low probability of raising the destructive power of hurricanes, this threat is enough to support a finding that coastal communities are endangered by greenhouse gas air pollution. In addition, coastal areas face other adverse impacts from sea level rise such as land loss due to inundation, erosion, wetland submergence, and habitat loss. The increased risk associated with these adverse impacts also endangers public welfare, with an increasing risk of greater adverse impacts in the future.”⁴²

Impacts to energy, infrastructure, and settlements: “Changes in extreme weather events threaten energy, transportation, and water resource infrastructure. Vulnerabilities of industry, infrastructure, and settlements to climate change are generally greater in high-risk locations, particularly coastal and riverine areas, and areas whose economies are closely linked with climate-sensitive resources. Climate change will likely interact with and possibly exacerbate ongoing environmental change and environmental pressures in settlements, particularly in Alaska where indigenous communities are facing major environmental and cultural impacts on their historic lifestyles.”⁴³

Impacts to wildlife: “Over the 21st century, changes in climate will cause some species to shift north and to higher elevations and fundamentally rearrange U.S. ecosystems. Differential capacities for range shifts and constraints from development, habitat fragmentation, invasive species, and broken ecological connections will likely alter ecosystem structure, function, and services, leading to predominantly negative consequences for biodiversity and the provision of ecosystem goods and services.”⁴⁴

In addition to these acknowledged impacts on public health and welfare more generally, climate change is causing and will continue to cause serious impacts on natural resources that the Department of Interior is specifically charged with safeguarding.⁴⁵

⁴¹ *Id.* at 66,498.

⁴² *Id.*

⁴³ *Id.*

⁴⁴ *Id.*; see also Third National Climate Assessment at 195-219.

⁴⁵ See Federal Land Policy and Management Act of 1976, 43 U.S.C. §§ 1701(a)(8), 1712(c)(1); Multiple-Use Sustained Yield Act of 1960, 16 U.S.C. § 528; National Environmental Policy Act of 1969, 42 U.S.C. §§ 4331-4332.

Impacts to Public Lands: Climate change is causing and will continue to cause specific impacts to public lands ecosystem services. Although public lands provide a variety of difficult-to-quantify public benefits, one recent Forest Service attempt at quantification estimates the public land ecosystem services at risk from climate change at between \$14.5 and \$36.1 billion annually.⁴⁶ In addition to the general loss of ecosystem services, irreplaceable species and aesthetic and recreational treasures are at risk of permanent destruction. High temperatures are causing loss of glaciers in Glacier National Park; the Park's glaciers are expected to disappear entirely by 2030, with ensuing warming of stream temperatures and adverse effects to aquatic ecosystems.⁴⁷ With effects of warming more pronounced at higher latitudes, tundra ecosystems on Alaska public lands face serious declines, with potentially serious additional climate feedbacks from melting permafrost.⁴⁸ In Florida, the Everglades face severe ecosystem disruption from already-occurring saltwater incursion.⁴⁹ Sea level rise will further damage freshwater ecosystems and the endangered species that rely on them.

Impacts to Biodiversity and Ecosystems: Across the United States ecosystems and biodiversity, including those on public lands, are directly under siege from climate change—leading to the loss of iconic species and landscapes, negative effects on food chains, disrupted migrations, and the degradation of whole ecosystems.⁵⁰ Specifically, scientific evidence shows that climate change is already causing changes in distribution, phenology, physiology, genetics, species interactions, ecosystem services, demographic rates, and population viability: many animals and plants are moving poleward and upward in elevation, shifting their timing of breeding and migration, and experiencing population declines and extirpations.⁵¹ Because climate change is occurring at an unprecedented pace with multiple synergistic impacts, climate change is predicted to result in catastrophic species losses during this century. For example, the IPCC concluded that 20% to 30% of plant and animal species will face an increased risk of extinction if global average temperature rise exceeds 1.5°C to 2.5°C relative to 1980-1999, with an increased risk of extinction for up to 70% of species worldwide if global average temperature exceeds 3.5°C relative to 1980-1999.⁵²

In sum, climate change, driven primarily by the combustion of fossil fuels, poses a severe and immediate threat to the health, welfare, ecosystems and economy of the United States. These impacts are felt across the nation, including upon the public lands the Secretary of the

⁴⁶ Esposito, Valerie et al., *Climate Change and Ecosystem Services: The Contribution and Impacts on Federal Public Lands in the United States*, USDA Forest Service Proceedings RMRS-P-64 at 155-164 (2011).

⁴⁷ U.S. Environmental Protection Agency, *Climate Change and Public Lands* (1999).

⁴⁸ See National Climate Assessment at 48; MacDougall, A. H., et al., Significant contribution to climate warming from the permafrost carbon feedback, 5 *Nature Geoscience* 719-721 (2012), doi:10.1038/ngeo1573.

⁴⁹ See National Climate Assessment at 592; Foti, Romano et al., Signs of critical transition in the Everglades wetlands in response to climate and anthropogenic changes, 110 *Proceedings of the National Academy of Sciences* 6296-6300, (2013), doi:10.1073/pnas.1302558110.

⁵⁰ National Climate Assessment at 13.

⁵¹ See Parmesan, C. and G. Yohe, A globally coherent fingerprint of climate change impacts across natural systems, 421 *Nature* 37-42 (2003); Root, T. et al., Fingerprints of global warming on wild animals and plants, 421 *Nature* 57-60 (2003); Chen, I. et al., Rapid range shifts of species associated with high levels of climate warming, 333 *Science* 1024-1026 (2011).

Interior is charged with safeguarding. A rapid and deep reduction of emissions generated from fossil fuels is essential if such threats are to be minimized and their impacts mitigated.

II. BLM Must Take a Hard Look at the Dangers of Hydraulic Fracking and Horizontal Drilling

NEPA regulations and case law require that BLM evaluate all “reasonably foreseeable” direct and indirect effects of its leasing prior to the “irretrievable” consequences of oil and gas leasing.⁵³ Oil and gas leasing is an irrevocable commitment to convey rights to use of federal land – a commitment with readily predictable environmental consequences that BLM is required to address.⁵⁴ Site-specific analyses of the consequences of harmful extraction practices, such as hydraulic fracturing, are therefore required at the leasing stage.

Unconventional extraction methods like horizontal drilling and hydraulic fracturing bring with them all of the harms to water quality, air quality, the climate, species, and communities associated with traditional oil and gas development, but also brings increased risks in many areas. The 2003 FFO RMP EIS makes no mention at all of these unconventional extraction methods or the impacts that such practices will have on the specific resources in the areas that BLM is offering for this lease sale. The use of hydraulic fracturing within the planning area is both readily foreseeable and already occurring with significant environmental consequences. The proposed leasing action is part of a dramatic recent increase in oil and gas leasing in the areas at issue, and reflects increased industry interest in developing New Mexico’s fossil fuel resources. The entire basis for this surge of interest is the possibility that hydraulic fracturing and other advanced recovery techniques will allow the profitable exploitation of geologic formations previously perceived as insufficiently valuable for development. Elements of these technologies have been used individually for decades. However, the combination of practices employed by industry recently is new: “Modern formation stimulation practices have become more complex and the process has developed into a sophisticated, engineered process in which production companies strive to design a hydraulic fracturing treatment to emplace fracture networks in specific areas.”⁵⁵ The increase in popularity of these unconventional extraction methods has also resulted in a growing body of science and research showing the environmental impacts of such techniques.

Hydraulic fracturing, a dangerous practice in which operators inject toxic fluid underground under extreme pressure to release oil and gas, has greatly increased industry interest in developing tightly held oil and gas deposits such as those in the proposed lease area. The first aspect of this technique is the hydraulic fracturing of the rock. When the rock is fractured, the resulting cracks in the rock serve as passages through which gas and liquids can flow, increasing

⁵³ See *N.M. ex rel. Richardson v. BLM*, 565 F.3d 683, 717-18 (10th Cir. 2009) (citing 42 U.S.C. § 4332(2)(C)(v) (An assessment of all ‘reasonably foreseeable’ impacts must occur at the earliest practicable point, and must take place before an ‘irretrievable commitment of resources’ is made.”) (emphasis added).

⁵⁴ *Id.* at 717 (citing to *Pennaco Energy, Inc. v. United States DOI*, 377 F.3d 1147, 1160 (10th Cir. 2004)) (The Tenth Circuit has concluded that issuing an oil and gas lease without an NSO stipulation constitutes an “irretrievable commitment of resources.”).

⁵⁵ Arthur, J. Daniel et al., *Hydraulic Fracturing Considerations for Natural Gas Wells of the Marcellus Shale* at 2 (Sep. 2008) (“Arthur”) at 9.

the permeability of the fractured area. To fracture the rock, the well operator injects hydraulic fracturing fluid at tremendous pressure. The composition of fracturing fluid has changed over time. Halliburton developed the practice of injecting fluids into wells under high pressure in the late 1940s;⁵⁶ however, companies now use permutations of “slick-water” fracturing fluid developed in the mid-1990s.⁵⁷ The main ingredient in modern fracturing fluid (or “frack fluid”) is generally water, although liquefied petroleum has also been used as a base fluid for modern fracking.⁵⁸ The second ingredient is a “proppant,” typically sand, that becomes wedged in the fractures and holds them open so that passages remain after pressure is relieved.⁵⁹ In addition to the base fluid and proppant, a mixture of chemicals are used, for purposes such as increasing the viscosity of the fluid, keeping proppants suspended, impeding bacterial growth or mineral deposition.⁶⁰

Frack fluid is hazardous to human health, although industry’s resistance to disclosing the full list of ingredients formulation of frack fluid makes it difficult for the public to know exactly how dangerous.⁶¹ A congressional report sampling incomplete industry self-reports found that “[t]he oil and gas service companies used hydraulic fracturing products containing 29 chemicals that are (1) known or possible human carcinogens, (2) regulated under the Safe Drinking Water Act for their risks to human health, or (3) listed as hazardous air pollutants under the Clean Air Act.”⁶² Recently published scientific papers also describe the harmfulness of the chemicals often in fracking fluid. One study reviewed a list of 944 fracking fluid products containing 632 chemicals, 353 of which could be identified with Chemical Abstract Service numbers.⁶³ The study concluded that more than 75 percent of the chemicals could affect the skin, eyes, and other sensory organs, and the respiratory and gastrointestinal systems; approximately 40 to 50 percent could affect the brain/nervous system, immune and cardiovascular systems, and the kidneys; 37 percent could affect the endocrine system; and 25 percent could cause cancer and mutations.⁶⁴

The impacts associated with the fracking-induced oil and gas development boom has caused some jurisdictions to place a moratorium or ban on fracking. For instance, in 2011 France became the first country to ban the practice.⁶⁵ In May, Vermont became the first state to

⁵⁶ Tompkins, How will High-Volume (Slick-water) Hydraulic Fracturing of the Marcellus (or Utica) Shale Differ from Traditional Hydraulic Fracturing? Marcellus Accountability Project at 1 (Feb. 2011).

⁵⁷ New York State Department of Environmental Conservation, Final Supplemental Generic Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program, Well Permit Issuance for Horizontal Drilling and High-Volume Hydraulic Fracturing to Develop the Marcellus Shale and Other Low-Permeability Gas Reservoirs (2015) (“NYDEC SGEIS”) at 5-5.

⁵⁸ *Id.*; Arthur at 10; Waxman, Henry et al., United States House of Representatives, Committee on Energy and Commerce, Minority Staff, Chemicals Used in Hydraulic Fracturing (Apr. 2011) (“Waxman 2011b”).

⁵⁹ Arthur at 10.

⁶⁰ Arthur at 10.

⁶¹ Waxman 2011b; *see also* Colborn, Theo et al., Natural Gas Operations for a Public Health Perspective, 17 Human and Ecological Risk Assessment 1039 (2011) (“Colborn 2011”); McKenzie, Lisa et al., Human Health Risk Assessment of Air Emissions from Development of Unconventional Natural Gas Resources, *Sci Total Environ* (2012), doi:10.1016/j.scitotenv.2012.02.018 (“McKenzie 2012”).

⁶² Waxman 2011b at 8.

⁶³ Colborn 2011 at 1.

⁶⁴ Colborn 2011 at 1.

⁶⁵ Castelvechi, Davide, *France becomes first country to ban extraction of natural gas by fracking*, *Scientific American* (Jun. 30, 2011).

ban fracking. Vermont’s governor called the ban “a big deal” and stated that the bill “will ensure that we do not inject chemicals into groundwater in a desperate pursuit for energy.”⁶⁶ New York State halted fracking within its borders in 2008, continued the moratorium in 2014 and banned the practice in 2015. The state’s seven-year review concluded that fracking posed risks to land, water, natural resources and public health.^{67 68} Also, New Jersey’s legislature recently passed a bill that would prevent fracking waste, like toxic wastewater and drill cuttings, from entering its borders,⁶⁹ and Pennsylvania, ground zero for the fracking debate, has banned “natural-gas exploration across a swath of suburban Philadelphia”⁷⁰ Numerous cities and communities, like Buffalo, Pittsburgh, Raleigh, Woodstock, and Morgantown have banned fracking.⁷¹

Separate from hydraulic fracturing, the second technological development underlying the recent shale boom is the use of horizontal drilling. Shale oil and shale gas formations are typically located far below the surface, and as such, the cost of drilling a vertical well to access the layer is high.⁷² The shale formation itself is typically a thin layer; however, such that a vertical well only provides access to a small volume of shale—the cylinder of permeability surrounding the well bore.⁷³ Although hydraulic fracturing increases the radius of this cylinder of shale, this effect is often itself insufficient to allow profitable extraction of shale resources.⁷⁴ Horizontal drilling solves this economic problem: by drilling sideways along the shale formation once it is reached, a company can extract resources from a much higher volume of shale for the same amount of drilling through the overburden, drastically increasing the fraction of total well length that passes through producing zones.⁷⁵ The practice of combining horizontal drilling with hydraulic fracturing was developed in the early 1990s.⁷⁶

A third technological development is the use of “multi-stage” fracking. In the 1990s industry began drilling longer and longer horizontal well segments. The difficulty of hydraulic fracturing increases with the length of the well bore to be fractured, however, both because

⁶⁶ CNN Staff Writer, *Vermont first state to ban fracking*, CNN U.S. (May 17, 2012).

⁶⁷ Public News Service - NY, *Cuomo Declares: No Fracking for Now in NY*. See: <http://www.publicnewsservice.org/2014-12-18/health-issues/cuomo-declares-no-fracking-for-now-in-ny/a43579-1>.

⁶⁸ RT Network staff writer, *It’s official: New York bans fracking*, RT Network (June 30, 2015) <https://www.rt.com/usa/270562-new-york-fracking-ban/>

⁶⁹ Tittel, Jeff, *Opinion: Stop fracking waste from entering New Jersey’s borders* NJ Times (Jul 14, 2012) available at http://www.nj.com/times-opinion/index.ssf/2012/07/opinion_stop_fracking_waste_fr.html

⁷⁰ Philly.com, *Fracking ban is about our water*, The Inquirer (Jul. 11, 2012).

⁷¹ CBS/AP, *Pittsburgh Bans Natural Gas Drilling* (2010), available at <http://www.cbsnews.com/stories/2010/11/16/national/main7060953.shtm>; Wooten, Michael *City of Buffalo Bans Fracking*, WGRZ.com News (Feb. 9, 2011); The Raleigh Telegram, *Raleigh City Council Bans Fracking Within City Limits* (Jul. 11, 2012); Kemble, William, *Woodstock bans activities tied to fracking*, Daily Freeman (Jul. 19, 2012); MetroNews.com, *Morgantown Bans Fracking* (June 22, 2011), available at <http://www.wvmetronews.com/news.cfm?func=displayfullstory&storyid=46214>.

⁷² CITI, *Resurging North American Oil Production and the Death of the Peak Oil Hypothesis* at 9 (Feb.15, 2012) (“CITI”); United States Energy Information Administration, *Review of Emerging Resources: U.S. Shale Gas and Shale Oil Plays* at 4 (Jul. 2011) (“USEIA 2011”); Orszag, Peter, *Fracking Boom Could Finally Cap Myth of Peak Oil* (Jan. 31, 2011) (“Orszag”).

⁷³ *Id.*

⁷⁴ *Id.*; Arthur at 8 (Figure 4).

⁷⁵ Venoco, Inc., *Monterey Shale Focused Analyst Day Slide Show* at 23 (May 26, 2010) (“Venoco Slide Show”), USEIA 2012a at 63.

⁷⁶ *Id.*

longer well segments are more likely to pass through varied conditions in the rock and because it becomes difficult to create the high pressures required in a larger volume.⁷⁷ In 2002 industry began to address these problems by employing multi-stage fracking. In multi-stage fracking, the operator treats only part of the wellbore at a time, typically 300 to 500 feet.⁷⁸ Each stage “may require 300,000 to 600,000 gallons of water,” and consequently, a frack job that is two or more stages can contaminate and pump into the ground over a million gallons of water.⁷⁹

Notwithstanding the grave impacts that these practices have on the environment, this new combination of multi-stage slickwater hydraulic fracturing and horizontal drilling has made it possible to profitably extract oil and gas from formations that only a few years ago were generally viewed as uneconomical to develop.⁸⁰ The effect of hydraulic fracturing on the oil and gas markets has been tremendous, with many reports documenting the boom in domestic energy production. A recent congressional report notes that “[a]s a result of hydraulic fracturing and advances in horizontal drilling technology, natural gas production in 2010 reached the highest level in decades.”⁸¹ A 2011 U.S. EIA report notes how recently these changes have occurred, stating that “only in the past 5 years has shale gas been recognized as a ‘game changer’ for the U.S. natural gas market.”⁸² With respect to oil, the EIA notes that oil production has been increasing, with the production of shale oil resources pushing levels even higher over the next decade:

Domestic crude oil production has increased over the past few years, reversing a decline that began in 1986. U.S. crude oil production increased from 5.0 million barrels per day in 2008 to 5.5 million barrels per day in 2010. Over the next 10 years, continued development of tight oil, in combination with the ongoing development of offshore resources in the Gulf of Mexico, pushes domestic crude oil production higher.⁸³

Thus, it is evident that fracking, including fracking with the most recent techniques that have been associated with serious adverse impacts in other areas of the country, is poised to expand; it is further evident that the oil and gas industry is still exploring new locations to develop, and the nation has not yet seen the full extent of fracking’s impact on oil and gas development and production.

In large part through the use of fracking, the oil and gas sector is now producing huge amounts of oil and gas throughout the United States, rapidly transforming the domestic energy outlook. Fracking is occurring in the absence of any adequate federal or state oversight. The current informational and regulatory void on the state level makes it even more critical that the BLM perform its legal obligations to review, analyze, disclose, and avoid and mitigate the impacts of its oil and gas leasing decisions. Further, given BLM’s failure to address the impacts

⁷⁷ NYDEC SGEIS at 5-93.

⁷⁸ *Id.*

⁷⁹ *Id.*

⁸⁰ See CITI at 9 ; USEIA 2011 at 4; Orszag,

⁸¹ Waxman 2011b at 1.

⁸² USEIA 2011 at 4.

⁸³ USEIA 2012a at 2

of fracking in any existing NEPA documents concerning the parcels at issue, it would be inappropriate for BLM to simply refer to the environmental analyses from such documents.

III. BLM Must Take a Hard Look at Risks to Water Resources

Oil and gas operations, including hydraulic fracturing and other unconventional stimulation methods, are significant threats to water resources. BLM must consider the impacts of such methods on the water resources in the areas to be leased.

A. Impacts on Water Resources Specific to Unconventional Stimulation Methods, Such as Hydraulic Fracturing and Horizontal Drilling

While much remains to be learned about fracking,⁸⁴ it is clear that the practice poses serious threats to water resources. Across the U.S., in states where fracking or other types of unconventional oil and gas recovery has occurred, surface water and groundwater have been contaminated. Recent studies have concluded that water contamination attributed to unconventional oil and gas activity has occurred in several states, including Colorado,⁸⁵ Wyoming,⁸⁶ Texas,⁸⁷ Pennsylvania,⁸⁸ Ohio,⁸⁹ and West Virginia.⁹⁰

The likelihood that the sale will result in fracking raises several issues that BLM must address:

- Where will the water come from and what are the impacts of extracting it?
- What chemicals will be used in the drilling and fracking process?
- How will BLM ensure the collection and disclosure of that information?

⁸⁴ U.S. Government Accountability Office, *Unconventional Oil and Gas Development – Key Environmental and Public Health Requirements* (2012); U.S. Government Accountability Office, *Oil and Gas – Information on Shale Resources, Development, and Environmental and Public Health Risks* (2012).

⁸⁵ Trowbridge, A., *Colorado Floods Spur Fracking Concerns*, CBS News, Sept. 17, 2013, available at http://www.cbsnews.com/8301-201_162-57603336/colorado-floods-spur-fracking-concerns/ (“Trowbridge 2013”) (accessed July 30, 2015).

⁸⁶ U.S. Environmental Protection Agency, *Draft Investigation of Ground Water Contamination near Pavillion, Wyoming* (2011) (“USEPA Draft Pavillion Investigation”); DiGiulio, Dominic C. et al. *Impact to Underground Sources of Drinking Water and Domestic Wells from Production Well Stimulation and Completion Practices in the Pavillion, Wyoming*, *Field, Environ. Sci. Technol.*, 2016, 50 (8), pp. 4524–4536, abstract available at <http://pubs.acs.org/doi/abs/10.1021/acs.est.5b04970>.

⁸⁷ Fontenot, Brian et al., *An evaluation of water quality in private drinking water wells near natural gas extraction sites in the Barnett Shale Formation*, *Environ. Sci. Technol.*, DOI: 10.1021/es4011724 (published online July 25, 2013) (“Fontenot 2013”).

⁸⁸ Jackson, Robert et al., *Increased Stray Gas Abundance in a Subset of Drinking Water Wells near Marcellus Shale Gas Extraction*, *Proc. Natl. Acad. of Sciences Early Edition*, doi: 10.1073/pnas.1221635110/-/DCSupplemental (2013) (“Jackson 2013”).

⁸⁹ Ohio Department of Natural Resources, *Report on the Investigation of the Natural Gas Invasion of Aquifers in Bainbridge Township of Geauga County, Ohio* (Sep. 2008) (“ODNR 2008”).

⁹⁰ Begos, K., *Four States Confirm Water Pollution*, Associated Press (January 5, 2014), available at <http://www.usatoday.com/story/money/business/2014/01/05/some-states-confirm-water-pollution-from-drilling/4328859/> (accessed July 29, 2015); see also U.S. EPA, *Assessment of the Potential Impacts of Hydraulic Fracturing for Oil and Gas on Drinking Water Resources*, External Review Draft (June 2015) (“EPA 2015”), available at http://ofmpub.epa.gov/eims/eimscomm.getfile?p_download_id=523539 (accessed July 30, 2015).

- What limitations will BLM place on the chemicals used in order to protect public health and the environment?
- What measures will BLM require to ensure adequate monitoring of water impacts, both during and after drilling?
- What baseline data is available to ensure that monitoring of impacts can be carried out effectively? How will BLM collect baseline data that is not currently available?
- Much of the fracking fluid return to the surface as toxic waste. Where will the discharge go?
- Is there the potential for subsurface migration of fracking fluids, or the potential for those fluids to escape into the groundwater by way of a faulty casing?
- What kinds of treatment will be required?
- What is the potential footprint and impact of the necessary treatment facilities?

BLM’s analysis of potential impacts to water must take account of all significant and “foreseeable” impacts to water that may arise from the sale, including the following issues.

1. Surface Water Contamination

Surface waters can be contaminated in many ways from unconventional well stimulation. In addition to storm water runoff, surface water contamination may also occur from chemical and waste transport, chemical storage leaks, and breaches in pit liners.⁹¹ The spilling or leaking of fracking fluids, flowback, or produced water is a serious problem. Harmful chemicals present in these fluids can include volatile organic compounds (“VOCs”), such as benzene, toluene, xylenes, and acetone.⁹² As much as 25 percent of fracking chemicals are carcinogens,⁹³ and flowback can even be radioactive.⁹⁴ As described below, contaminated surface water can result in many adverse effects to wildlife, agriculture, and human health and safety. It may make waters unsafe for drinking, fishing, swimming and other activities, and may be infeasible to restore the original water quality once surface water is contaminated. BLM should consider these impacts in the EIS.

i. Chemical and Waste Transport

Massive volumes of chemicals and wastewater used or produced in oil and gas operations have the potential to contaminate local watersheds. Between 2,600 to 18,000 gallons of chemicals are injected per hydraulically fracked well depending on the number of chemicals injected.⁹⁵ This waste can reach fresh water aquifers and drinking water.

⁹¹ Vengosh, Avner et al., A Critical Review of the Risks to Water Resources from Unconventional Shale Gas Development and Hydraulic Fracturing in the United States, Environ. Sci. Technol., DOI: 10.1021/es405118y (2014) (“Vengosh 2014”).

⁹² U.S. Environmental Protection Agency, Plan to Study the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources (Nov. 2011) (“EPA Plan to Study Fracking Impacts”).

⁹³ Colborn 2011.

⁹⁴ EPA Plan to Study Fracking Impacts; White, Ivan E., Consideration of radiation in hazardous waste produced from horizontal hydrofracking, National Council on Radiation Protection (2012).

⁹⁵ EPA 2015 at ES-12.

Produced waters that fracking operations force to the surface from deep underground can contain high levels of total dissolved solids, salts, metals, and naturally occurring radioactive materials.⁹⁶ If spilled, the effects of produced water or brine can be more severe and longer-lasting than oil spills, because salts do not biodegrade or break down over time.⁹⁷ The only way to deal with them is to remove them.⁹⁸ The accumulation of long-lived isotopes of radium has been observed in the sediments and soils of produced-water spill sites.⁹⁹ Due to its relatively long half-life, radium contamination could remain in the soil for thousands of years.¹⁰⁰ Flowback waters (i.e., fracturing fluids that return to the surface) may also contain similar constituents along with fracturing fluid additives such as surfactants and hydrocarbons.¹⁰¹ Given the massive volumes of chemicals and wastewater produced, their potentially harmful constituents, and their persistence in the environment, the potential for environmental disaster is real.

Fluids must be transported to and/or from the well, which presents opportunities for spills.¹⁰² Unconventional well stimulation relies on numerous trucks to transport chemicals to the site as well as collect and carry disposal fluid from the site to processing facilities. A U.S. Government Accountability Office (GAO) study found that up to 1,365 truck loads can be required just for the drilling and fracturing of a single well pad¹⁰³ while the New York Department of Conservation estimated the number of “heavy truck” trips to be about 3,950 per horizontal well (including unloaded and loaded trucks).¹⁰⁴ Accidents during transit may cause leaks and spills that result in the transported chemicals and fluids reaching surface waters. Chemicals and waste transported by pipeline can also leak or spill. There are also multiple reports of truckers dumping waste uncontained into the environment.¹⁰⁵

The EIS should evaluate how often accidents can be expected to occur, and the effect of chemical and fluid spills on present resources. Such analysis should also include identification of the particular harms faced by communities near oil and gas fields. The EIS must include specific

⁹⁶ Brittingham, Margaret C. et al., *Ecological Risks of Shale Oil and Gas Development to Wildlife, Aquatic Resources and their Habitats*, *Environ. Sci. Technol.* 2014, 48, 11034-11047, p. 11039; Lauer, Nancy E. *Brine Spills Associated with Unconventional Oil Development in North Dakota*. *Environmental Science & Technology Article ASAP*, DOI: 10.1021/acs.est.5b06349 (April 27, 2016), available at

<http://pubs.acs.org/doi/abs/10.1021/acs.est.5b06349> (finding contaminants such as ammonium, selenium, and lead at produced-water spill sites in North Dakota, and contamination in violation of national water quality regulations

⁹⁷ *Id.* at G (observing contamination from produced water “is remarkably persistent in the environment” and “elevated levels of salts and trace elements... can be preserved in spill sites for at least months to years”); King, Pamela, *Limited study supports findings on bigger brine spill risks*, *E&E News* (Nov. 4, 2015) (“King 2015”)

⁹⁸ *Id.*

⁹⁹ Lauer 2016 at G.

¹⁰⁰ *Id.*

¹⁰¹ King 2015.

¹⁰² Warco, Kathy, *Fracking truck runs off road; contents spill*, *Observer Reporter* (Oct 21, 2010).

¹⁰³ U.S. Government Accountability Office, *Oil and Gas: Information on Shale Resources, Development, and Environmental and Public Health Risks*, GAO 12-732 (2012) at 33.

¹⁰⁴ NYDEC SGEIS at Ch. 6 Potential Environmental Impacts (2015) at 6-306 –available at http://www.dec.ny.gov/docs/materials_minerals_pdf/fsgeis2015.pdf.

¹⁰⁵ Kusnetz, Nicholas, *North Dakota’s Oil Boom Brings Damage Along with Prosperity* at 4, *ProPublica* (June 7, 2012) (“Kusnetz North Dakota”); *E&E News*, *Ohio man pleads not guilty to brine dumping* (Feb. 15, 2013).

mitigation measures and alternatives based on a cumulative impacts assessment, and the particular vulnerabilities of environmental justice communities in both urban and rural settings.

ii. On-site Chemical Storage and Processing

Thousands of gallons of chemicals can be potentially stored on-site and used during hydraulic fracturing and other unconventional well stimulation activities.¹⁰⁶ These chemicals can be susceptible to accidental spills and leaks. Natural occurrences such as storms and earthquakes may cause accidents, as can negligent operator practices.

Some sites may also use on-site wastewater treatment facilities. Improper use or maintenance of the processing equipment used for these facilities may result in discharges of contaminants. Other causes of spills include equipment failure (most commonly, blowout preventer failure, corrosion and failed valves) and failure of container integrity.¹⁰⁷ Spills can result from accidents, negligence, or intentional dumping.

The EIS should examine and quantify the risks to human health and the environment associated with on-site chemical and wastewater storage, including risks from natural events and negligent operator practices. Again, such analysis must also include an analysis of potential impacts faced by environmental justice communities in both rural and urban settings.

2. *Groundwater Contamination*

Studies have reported many instances around the country of groundwater contamination due to surface spills of oil and gas wastewater, including fracking flowback.¹⁰⁸ Fracking and other unconventional techniques likewise pose inherent risks to groundwater due to releases below the surface, and these risks must be properly evaluated.¹⁰⁹ Once groundwater is contaminated, it is very difficult, if not impossible, to restore the original quality of the water. As a result, in communities that rely on groundwater drinking water supplies, groundwater contamination can deprive communities of usable drinking water. Such long-term contamination necessitates the costly importation of drinking water supplies.

Groundwater contamination can occur in a number of ways, and the contamination may persist for many years.¹¹⁰ Improper well construction and surface spills are cited as a confirmed or potential cause of groundwater contamination in numerous incidents at locations across the U.S. including but not limited to Colorado,¹¹¹ Wyoming,¹¹² Pennsylvania,¹¹³ Ohio,¹¹⁴ West

¹⁰⁶ EPA 2015 at ES-10.

¹⁰⁷ EPA 2015 at ES-11.

¹⁰⁸ See, e.g., Fontenot 2013; Jackson 2013.

¹⁰⁹ Vengosh 2014.

¹¹⁰ Myers, Tom, Potential Contamination Pathways from Hydraulically Fractured Shale to Aquifers, National Groundwater Association (2012).

¹¹¹ Gross, Sherilyn A. et al., Abstract: Analysis of BTEX groundwater concentrations from surface spills associated with hydraulic fracturing operations, 63 J. Air and Waste Mgmt. Assoc. 4, 424 doi: 10.1080/10962247.2012.759166 (2013).

¹¹² U.S. Environmental Protection Agency, Draft Investigation of Ground Water Contamination Near Pavillion, Wyoming (2011) (“EPA Draft Pavillion Investigation”).

Virginia,¹¹⁵ and Texas.¹¹⁶ These sorts of problems at the well are not uncommon. Dr. Ingraffea of Cornell has noted an 8.9 percent failure rate for wells in the Marcellus Shale.¹¹⁷ Older wells that may not have been designed to withstand the stresses of hydraulic fracturing but which are reused for this purpose are especially vulnerable.¹¹⁸

Current federal rules do not ensure well integrity. The EIS should study the rates of well casing failures over time and evaluate the likelihood that well casing failures can lead to groundwater contamination.

Also, fluids and hydrocarbons may contaminate groundwater by migrating through newly created or natural fractures.¹¹⁹ Many unconventional techniques intentionally fracture the formation to increase the flow of gas or oil. New cracks and fissures can allow the additives or naturally occurring elements such as natural gas to migrate to groundwater. “[T]he increased deployment of hydraulic fracturing associated with oil and gas production activities, including techniques such as horizontal drilling and multi-well pads, may increase the likelihood that these pathways could develop,” which, “in turn, could lead to increased opportunities for impacts on drinking water sources.”¹²⁰ Fluids can also migrate through pre-existing and natural faults and fractures that may become pathways once the fracking or other method has been used.

A well in which stimulation operations are being conducted may also “communicate” with nearby wells, which may lead to groundwater and surface contamination, particularly if the nearby wells are improperly constructed or abandoned.¹²¹ In the last 150 years, as many as 12 million “holes” have been drilled across the United States in search of oil and gas, many of

¹¹³ Darrah, Thomas H. et al., Noble Gases Identify the Mechanisms of Fugitive Gas Contamination in Drinking-Water Wells Overlying the Marcellus and Barnett Shales, *Proc. Natl. Acad. Of Sciences Early Edition*, doi: 10.1073/pnas.1322107111 (2014) (“Darrah 2014”).

¹¹⁴ Begos, Kevin, *Some States Confirm Water Pollution from Oil, Gas Drilling*, *Seattle Times*, Jan. 6, 2014, <http://www.seattletimes.com/business/some-states-confirm-water-pollution-from-oil-gas-drilling/> (accessed July 29, 2015) (“Begos, Seattle Times, Jan 6, 2014”). *See also*, ODNR 2008, *supra*.

¹¹⁵ Begos, *Seattle Times*, Jan 6. 2014.

¹¹⁶ Darrah 2014.

¹¹⁷ Ingraffea, Anthony R., Some Scientific Failings within High Volume Hydraulic Fracturing Proposed Regulations 6 NYCRR Parts 550-556, 560, Comments and Recommendations Submitted to the NYS Dept. of Environmental Conservation (Jan 8, 2013); *see also* Davies, Richard J. et al. Oil and gas wells and their integrity: Implications for shale and unconventional resource exploitation, *Marine and Petroleum Geology* 56 (2014) 239e254, available at http://ac.els-cdn.com/S0264817214000609/1-s2.0-S0264817214000609-main.pdf?_tid=7344676e-d5f1-11e5-9200-00000aab0f02&acdnat=1455767050_bdf90f64ecdb607187778614024039c4 (documenting 6.3% of wells in the Marcellus shale experienced well barrier or integrity failure between 2005 and 2013).

¹¹⁸ EPA 2015 at 6-11.

¹¹⁹ EPA Draft Pavillion Investigation; Warner, Nathaniel R., et al., Geochemical Evidence for Possible Natural Migration of Marcellus Formation Brine to Shallow Aquifers in Pennsylvania, *PNAS Early Edition* (2012).

¹²⁰ EPA 2015 at 6-55.

¹²¹ *See* Detrow, Scott. (2012) *Perilous Pathways: How Drilling Near An Abandoned Well Produced a Methane Geyser*, StateImpact Pennsylvania, National Public Radio (October 9, 2012), *available at* <https://stateimpact.npr.org/pennsylvania/2012/10/09/perilous-pathways-how-drilling-near-an-abandoned-well-produced-a-methane-geyser/> (accessed July 29, 2015); Alberta Energy Board, Directive 083: Hydraulic Fracturing – Subsurface Integrity, Alberta Energy Regulator (2013), *available at* <http://www.aer.ca/documents/directives/Directive083.pdf>.

which are old and decaying, or are in unknown locations.¹²² Fracking can contaminate water resources by intersecting one of those wells. For instance, one study found at least nineteen instances of fluid communication in British Columbia and Western Alberta.¹²³ Wells as far away as 1.8 miles away have provided pathways for surface contamination.¹²⁴ The EIS must consider long-term studies on the potential for fluid migration through newly created subsurface pathways

According to the EPA, “evidence of any fracturing-related fluid migration affecting a drinking water resources...could take years to discover.”¹²⁵ Another study based on modeling found that advective transport of fracking fluid from a fracked well to an aquifer could occur in less than 10 years.¹²⁶

Contamination of groundwater of drinking water sources is a real risk. The EPA’s Draft Investigation of Groundwater Contamination near Pavillion, Wyoming, found that chemicals found in samples of groundwater were from fracked wells.¹²⁷ These results have been confirmed with follow-up analyses.¹²⁸ Groundwater contamination in the Barnett Shale region is likely a result of unconventional well development activities.¹²⁹ One study detected “multiple volatile organic carbon compounds throughout the region, including various alcohols, the BTEX family of compounds, and several chlorinated compounds” in private and public drinking water well samples drawn from aquifers overlying the Barnett shale formation.”¹³⁰ Another study found that “arsenic, selenium, strontium and total dissolved solids (TDS) exceeded the Environmental Protection Agency’s Drinking Water Maximum Contaminant Limit (MCL) in some samples from private water wells located within 3 km of active natural gas wells.¹³¹ Many of the detected compounds were associated with unconventional oil and gas extraction.¹³²

Fracking fluid can also spill at the surface during the fracking process. For instance, mechanical failure or operator error during the process has caused leaks from tanks, valves, and

¹²² Kusnetz, Nicholas, *Deteriorating Oil and Gas Wells Threaten Drinking Water, Homes Across the Country*, ProPublica (April 4, 2011).

¹²³ BC Oil & Gas Commission, Safety Advisory 2010-03, Communication During Fracture Stimulation (2010).

¹²⁴ King, Pamela, ‘Frack hits’ provide pathways for methane migration study, E&E News (Oct. 21, 2015).

¹²⁵ EPA 2015 at 6-56 – 6-57.

¹²⁶ Myers, Tom, Potential Contaminant Pathways from Hydraulically Fractured Shale to Aquifers, *Ground Water* 50, no. 6, p. 1 (2012).

¹²⁷ EPA Draft Pavillion Investigation.

¹²⁸ Drajem, Mark, *Wyoming Water Tests in Line with EPA Finding on Fracking*, Bloomberg (Oct. 11, 2012); U.S. Environmental Protection Agency, Investigation of Ground Water Contamination near Pavillion, Wyoming Phase V Sampling Event - Summary of Methods and Results (September 2012); Myers, Tom, Review of DRAFT: Investigation of Ground Water Contamination near Pavillion Wyoming Prepared by the Environmental Protection Agency, Ada OK (Apr. 30, 2012).

¹²⁹ Hildenbrand, Zacariah, A Comprehensive Analysis of Groundwater Quality in The Barnett Shale Region, *Environ. Sci. Technol.* Just Accepted Manuscript June 16, 2015) DOI: 10.1021/acs.est.5b01526

¹³⁰ *Id.*

¹³¹ Fontenot, Brian et al., An Evaluation of Water Quality in Private Drinking Water Wells Near Natural Gas Extraction Sites in the Barnett Shale Formation, *Environ. Sci. Technol.*, 47 (17), 10032–10040 DOI: 10.1021/es4011724, available at <http://pubs.acs.org/doi/abs/10.1021/es4011724> (“Fontenot 2013”).

¹³² *Id.*

pipes.¹³³ At the surface, pits or tanks can leak fracking fluid or waste.¹³⁴ Surface pits, in which wastewater is often dumped, are a major source of pollution. In California, a farmer was awarded \$8.5 million in damages after his almond trees died when he irrigated them with well water that had been contaminated by nearby oil and gas operations. The contamination was traced to unlined pits where one of California's largest oil and gas producers for decades dumped billions of gallons of wastewater that slowly leached pollutants into nearby groundwater.¹³⁵

Unfiltered drinking water supplies, such as drinking water wells, are especially at risk because they have no readily available means of removing contaminants from the water. Even water wells with filtration systems are not designed to handle the kind of contaminants that result from unconventional oil and gas extraction.¹³⁶ In some areas hydraulic fracturing may occur at shallower depths or within the same formation as drinking water resources, resulting in direct aquifer contamination.¹³⁷ The EIS must disclose where the potential for such drilling exists.

Setbacks may not be adequate to protect groundwater from potential fracking fluid contamination. A recent study by the University of Colorado at Boulder suggests that setbacks of even up to 300-feet may not prevent contamination of drinking water resources.¹³⁸ The study found that 15 organic compounds found in hydraulic fracturing fluids may be of concern as groundwater contaminants based on their toxicity, mobility, persistence in the environment, and frequency of use. These chemicals could have 10 percent or more of their initial concentrations remaining at a transport distance of 300 feet, the average "setback" distance in the U.S. The effectiveness and feasibility of any proposed setbacks must be evaluated.

3. Water Depletion

Some unconventional extraction techniques, most notably fracking, require the use of tremendous amounts of freshwater. Typically between 2 and 5.6 million gallons of water are required to frack each well.¹³⁹ These volumes far exceed the amounts used in conventional natural gas development.¹⁴⁰

¹³³ Natural Resources Defense Council, *Water Facts: Hydraulic Fracturing Can Potentially Contaminate Drinking Water Sources* (2012) at 2; Food and Water Watch, *The Case for a Ban on gas Fracking* (June 2011) at 7 ("Food & Water Watch 2011")

¹³⁴ See, e.g., E&E Staff Writer, *Fracking Fluid leaks from wellhead in Colo.*, E&E News (Feb 14, 2013). ("At least 84,000 gallons of water contaminated from hydraulic fracturing seeped from a broken wellhead and into a field . . ."); Michaels, Craig, et al., *Fractured Communities: Case Studies of the Environmental Impacts of Industrial Gas Drilling*, Riverkeeper (2010) at 12.

¹³⁵ Renee Sharp & Bill Allayud, *California Regulator: See No Fracking, Speak No Fracking* at 6 (2012); see also Miller, Jeremy, *Oil and Water Don't Mix with California Agriculture*, High Country News (2012).

¹³⁶ Physicians, Scientist & Engineers for Healthy Energy, Letter from Robert Howarth Ph.D. and 58 other scientists to Andrew M. Cuomo, Governor of New York State re: municipal drinking water filtration systems and hydraulic fracturing fluid (Sept 15, 2011), available at

http://www.psehealthyenergy.org/data/Cuomo_ScientistsLetter_15Sep20112.pdf (accessed July 29, 2015).

¹³⁷ EPA 2015 at ES-15.

¹³⁸ University of Colorado--Boulder, *New study identifies organic compounds of potential concern in fracking Fluids* (July 1, 2015), available at <http://www.colorado.edu/news/releases/2015/06/30/newstudyidentifiesorganiccompoundspotentialconcernfrackingfluids> (accessed July 29, 2015).

¹³⁹ U.S. Government Accountability Office 2012 at 17.

¹⁴⁰ See Clark, Corrie E. et al., *Life Cycle Water Consumption for Shale Gas and Conventional Natural Gas*,

Water used in large quantities may lead to several kinds of harmful environmental impacts. The extraction of water for fracking can, for example, lower the water table, affect biodiversity, harm local ecosystems, and reduce water available to communities.¹⁴¹

Withdrawal of large quantities of freshwater from streams and other surface waters will undoubtedly have an impact on the environment.¹⁴² Withdrawing water from streams will decrease the supply for downstream users, such as farmers or municipalities. Rising demand from oil and gas operators has already led to increased competition for water between farmers and oil and gas operators. In some regions of Colorado, farmers have had to fallow fields due to astronomical water prices.¹⁴³ For example, in prior years, farmers in Colorado have paid at most \$100 per acre-feet of water in auctions held by cities with excess supplies, but in 2013 energy companies paid \$1200 to \$2,900 per acre-feet.¹⁴⁴ Reductions in stream flows may also lead to downstream water quality problems by diminishing the water bodies' capacity for dilution and degradation.

Furthermore, withdrawing large quantities of water from subsurface waters to supply oil and gas production will likely deplete and harm aquifers. Removing water from surface water or directly from underground sources of water faster than the rate that aquifers can be replenished will lower the volume of water available for other uses. Depletion can also lead to compaction of the rock formation serving as an aquifer, after which the original level of water volume can never be restored.¹⁴⁵ Depleted aquifer water resources may also adversely affect agriculture, species habitat and ecosystems, and human health.

The freshwater in the planning areas therefore would be greatly affected by the increased demand for water if fracking and other unconventional oil and gas extraction are permitted. A no-fracking alternative would preserve scarce water resources and keep critical sources of drinking water in the planning area safe and clean. The EIS must analyze where water will be sourced, how much, and the effects on water sources under different alternatives. All of these effects must be analyzed in the context of increasing water scarcity in the planning area due to climate change, drought, and increasing population growth.

B. Disposal of Drilling and Fracking Wastes Will Contaminate Water Resources

Environ. Sci. Technol., 2013, 47 (20), pp 11829–11836, abstract *available at* <http://pubs.acs.org/doi/abs/10.1021/es4013855>.

¹⁴¹ International Energy Agency, Golden Rules for the Golden Age of Gas at 31-32 (2012).

¹⁴² See Entrekin, Sally et al., *Rapid Expansion of Natural Gas Development Poses a Threat to Surface Waters*, 9 Front Ecol. Environ. 9, 503 (2011); EPA 2015 at 4-16.

¹⁴³ Healy, Jack. For Farmers in the West, Oil Wells are Thirsty Rivals, The New York Times (Sept. 5, 2012), available at http://www.nytimes.com/2012/09/06/us/struggle-for-water-in-colorado-with-rise-in-fracking.html?_r=0 (accessed July 29, 2015); Burke, Garance. Fracking fuels water fights in nation's dry spots, Associated Press (June 17, 2013), available at <http://news.yahoo.com/fracking-fuels-water-fights-nations-dry-spots-133742770.html>.

¹⁴⁴ *Id.*

¹⁴⁵ Freyman, Monika and Ryan Salmon, Hydraulic Fracturing and Water Stress: Growing Competitive Pressures for Water, CERES, 9 (2013) ("Freyman 2013"), available at <http://www.ceres.org/resources/reports/hydraulic-fracturing-water-stress-water-demand-by-the-numbers>.

Disposal of wastes from oil and gas operations can also lead to contamination of water resources. Potential sources of contamination include:

- leaching from landfills that receive drilling and fracking solid wastes;
- spreading of drilling and fracking wastes over large areas of land;
- wastewaters discharged from treatment facilities without advanced “total dissolved solids” removal processes, or inadequate capacity to remove radioactive material removal; and
- breaches in underground injection disposal wells.¹⁴⁶

U.S. EPA has found that California’s Class II underground injection well program to be insufficiently protective of groundwater resources.¹⁴⁷

The EIS must evaluate the potential for contamination from each of these disposal methods.

C. More Intensive Oil and Gas Development Will Increase Storm Water Runoff

Oil and gas operations require land clearance for access roads, pipelines, well pads, drilling equipment, chemical storage, and waste disposal pits. As a result, new oil and gas development will cause short-term disturbance as well as long-term disturbance within the areas for lease. While undisturbed land can retain greater amounts of water through plants and pervious soil, land that has been disturbed or developed may be unable to retain as much water, thereby increasing the volume of runoff. The area of land that is able to retain water will be significantly decreased if unconventional oil and gas extraction methods are permitted to expand.

Water from precipitation and snowmelt can serve as an avenue through which contaminants travel from an operation site to sensitive areas, including population centers. Contaminated water runoff may seep into residential areas, polluting streets, sidewalks, soil, and vegetation in urban areas, adversely affecting human health. Thus, not only do these oil and gas activities create pollution, they create greater conduits for storm water runoff to carry those pollutants from the operation site, into areas in which significant harm can be caused.

Rapid runoff, even without contaminants, can harm the environment by changing water flow patterns and causing erosion, habitat loss, and flooding. Greater runoff volumes may also increase the amount of sediment that is carried to lakes and streams, affecting the turbidity and chemical content of surface waters. Because a National Pollutant Discharge Elimination System permit is not required for oil and gas operations,¹⁴⁸ it is particularly important that the impact of runoff is considered as part of the NEPA process.

¹⁴⁶ EPA 2015, 8-20, 8-36, 8-48, 8-65, 8-70; USGS, Indication of Unconventional Oil and Gas Wastewaters Found in Local Surface Waters, available at http://toxics.usgs.gov/highlights/2016-05-09-uog_wastes_in_streams.html.

¹⁴⁷ Walker, James, California Class II UIC Program Review, Report submitted to Ground Water Office USEPA Region 9 at 119 (Jun. 2011); U.S. Environmental Protection Agency Region IX, Letter from David Albright, Manager Ground Water, to Elena Miller, State Oil and Gas Supervisor Dept of Conservation re California Class II Underground Injection Control (UIC) Program Review final report (July 18, 2011).

¹⁴⁸ 33 U.S.C. § 1342(1)(2).

D. Oil and Gas Developments Harm Aquatic Life and Habitat

When streams and other surface waters are depleted, the habitat for countless plants and animals will be harmed, and the depletion places tremendous pressure on species that depend on having a constant and ample stream of water. Oil and gas activities could also increase the risk of toxic spills and leaks, harming aquatic species that inhabit areas downstream from spill sites. A pair of studies that compared water quality downstream from a wastewater injection site in West Virginia to that of upstream areas found (1) downstream sites had elevated levels of endocrine-disrupting chemicals at levels known to adversely affect aquatic organisms; and (2) microbial communities in downstream sediments had lower diversity and shifts in community composition, altering microbial activity and potentially impacting nutrient cycling.¹⁴⁹

Physical habitats such as banks, pools, runs, and glides (low gradient river sections) are important yet susceptible to disturbance with changing stream flows. Altering the volume of water can also change the water's temperature and oxygen content, harming some species that require a certain level of oxygenated water. Decreasing the volume of streamflow and stream channels by diverting water to fracking would have a negative impact on the environment.

The physical equipment itself that is designed to intake and divert water may also pose a threat to certain wildlife. If not properly designed, such equipment and intake points may be a risk to wildlife.

E. Harm to Wetlands

Oil and gas development, and particularly the practice of fracking, pose an immense threat to water resources. High volume removal of surface or groundwater can result in damage to wetlands, which rely on ample water supplies to maintain the fragile dynamics of a wetland habitat. Damage can also occur from spills of chemicals or wastewater, filling operations, and sediment runoff.¹⁵⁰ BLM in its environmental document must fully vet the impacts from every potential aspect of the proposed sale.

Many plant and animal species depend on wetland habitats, and even small changes can lead to significant impacts. Wetlands provide a variety of “eco-service” functions, including

¹⁴⁹ Akob, D.M., et al., 2016, Wastewater disposal from unconventional oil and gas development degrades stream quality at a West Virginia injection facility: Environmental Science and Technology, doi:10.1021/acs.est.6b00428 (Advanced Web release); Kassotis, C.D., et al., 2016, Endocrine disrupting activities of surface water associated with a West Virginia oil and gas Industry wastewater disposal site: Science of the Total Environment, v. 557–558, p. 901910, doi:10.1016/j.scitotenv.2016.03.113. The two studies are summarized at: http://toxics.usgs.gov/highlights/2016-05-09-uog_wastes_in_streams.html.

¹⁵⁰ U.S. Department of Justice, *Trans Energy Inc. to Restore Streams and Wetland Damaged by Natural Gas Extraction Activities in West Virginia* (Sep. 2, 2014), <http://www.justice.gov/opa/pr/trans-energy-inc-restore-streams-and-wetland-damaged-natural-gas-extraction-activities-west> (accessed July 29, 2015); *See also*, Pennsylvania Department of Environmental Protection, Commonwealth of Pennsylvania, DEP Fines Seneca Resources Corp. \$40,000 for Violations at Marcellus Operation in Tioga County (Jul. 10, 2010), <http://www.portal.state.pa.us/portal/server.pt/community/newsroom/14287?id=14655&typeid=1> (accessed July 29, 2015).

water purification, protection from floods, and functioning as carbon sinks.¹⁵¹ The ecological importance of wetlands is unquestionable, and their full protection is paramount. The EIS must analyze these potential impacts to wetlands, and the related, potential indirect impacts that may stem from such impacts.

IV. BLM Must Take a Hard Look at Harm to Air Quality

Oil and gas operations emit numerous air pollutants, including volatile organic compounds (VOCs), NO_x, particulate matter, hydrogen sulfide, and methane. Fracking operations are particularly harmful, emitting especially large amounts of pollution, including air toxic air pollutants. Permitting fracking and other well stimulation techniques will greatly increase the release of harmful air emissions in these and other regions. BLM should disallow new leasing, or else adopt a no-fracking alternative, which would prevent further degradation of local air quality, respiratory illnesses, premature deaths, hospital visits, as well as missed school and work days.

A. Types of Air Emissions

Unconventional oil and gas operations emit large amounts of toxic air pollutants,¹⁵² also referred to as Hazardous Air Pollutants, which are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects.¹⁵³ The reporting requirements recently implemented by the California South Coast Air Quality Management District (“SCAQMD”) have shown that at least 44 chemicals known to be air toxics have been used in fracking and other types of unconventional oil and gas recovery in California.¹⁵⁴ Through the implementation of these new reporting requirements, it is now known that operators have been using several types of air toxics in California, including crystalline silica, methanol, hydrochloric acid, hydrofluoric acid, 2-butoxyethanol, ethyl glycol monobutyl ether, xylene, amorphous silica fume, aluminum oxide, acrylic polymer, acetophenone, and ethylbenzene. Many of these chemicals also appear on the U.S. EPA’s list of hazardous air pollutants.¹⁵⁵ EPA has also identified six “criteria” air pollutants that must be regulated under the National Ambient Air Quality Standards (NAAQS) due to their potential to cause primary and secondary health effects. Concentrations of these pollutants—ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide and lead—will likely increase in regions where unconventional oil and gas recovery techniques are permitted.

VOCs, from car and truck engines as well as the drilling and completion stages of oil and gas production, make up about 3.5 percent of the gases emitted by oil or gas operations.¹⁵⁶ The

¹⁵¹ U.S. Environmental Protection Agency, Wetlands and People, <http://water.epa.gov/type/wetlands/people.cfm> (accessed July 29, 2015).

¹⁵² Sierra Club et al. comments on New Source Performance Standards: Oil and Natural Gas Sector; Review and Proposed Rule for Subpart OOOO (Nov. 30, 2011) (“Sierra Club Comments”) at 13.

¹⁵³ U.S. EPA, Hazardous Air Pollutants, *available at* <http://www.epa.gov/haps> (accessed Jan. 10, 2016).

¹⁵⁴ Center for Biological Diversity, Air Toxics One Year Report, p. 1 (June 2014).

¹⁵⁵ U.S. Environmental Protection Agency, The Clean Air Act Amendments of 1990 List of Hazardous Air Pollutants, Technology Transfer Network Air Toxics Web Site, <http://www.epa.gov/ttnatw01/orig189.html> (accessed July 29, 2015).

¹⁵⁶ Brown, Heather, Memorandum to Bruce Moore, U.S.EPA/OAQPS/SPPD re Composition of Natural Gas for use in the Oil and Natural Gas Sector Rulemaking, July 28, 2011 (“Brown Memo”) at 3.

VOCs emitted include the BTEX compounds – benzene, toluene, ethyl benzene, and xylene – which are listed as Hazardous Air Pollutants.¹⁵⁷ There is substantial evidence showing the grave harm from these pollutants.¹⁵⁸ Recent studies and reports confirm the pervasive and extensive amount of VOCs emitted by unconventional oil and gas extraction.¹⁵⁹ In particular, a study covering sites near oil and gas wells in five different states found that concentrations of eight volatile chemicals, including benzene, formaldehyde and hydrogen sulfide, exceeded risk-based comparison values under several operational circumstances.¹⁶⁰ Another study determined that vehicle traffic and engine exhaust were likely the sources of intermittently high dust and benzene concentrations observed near well pads.¹⁶¹ Recent studies have found that oil and gas operations are likely responsible for elevated levels of hydrocarbons such as benzene downwind of the Denver-Julesburg Fossil Fuel Basin, north of Denver.¹⁶² Another study found that oil and gas operations in this area emit approximately 55% of the VOCs in northeastern Colorado.¹⁶³

VOCs can form ground-level (tropospheric) ozone when combined with nitrogen oxides (“NO_x”), from compressor engines, turbines, other engines used in drilling, and flaring,¹⁶⁴ and sunlight. This reaction can diminish visibility and air quality and harm vegetation. Tropospheric ozone can also be caused by methane, which is leaked and vented at various stages of unconventional oil and gas development, as it interacts with nitrogen oxides and sunlight.¹⁶⁵ In addition to its role as a greenhouse gas, methane contributes to increased concentrations of ground-level ozone, the primary component of smog, because it is an ozone precursor.¹⁶⁶ Methane’s effect on ozone concentrations can be substantial. One paper modeled reductions in various anthropogenic ozone precursor emissions and found that “[r]educing anthropogenic CH₄ emissions by 50% nearly halves the incidence of U.S. high-O₃ events”¹⁶⁷

¹⁵⁷ 42 U.S.C. § 7412(b).

¹⁵⁸ Colborn 2011; McKenzie 2012; Food & Water Watch 2011.

¹⁵⁹ McCawley, M., Air, Noise, and Light Monitoring Plan for Assessing Environmental Impacts of Horizontal Gas Well Drilling Operations (ETD-10 Project), West Virginia University School of Public Health, Morgantown, WV (2013) (“McCawley 2013”), available at <http://www.dep.wv.gov/oil-and-gas/Horizontal-Permits/legislativestudies/Documents/WVU%20Final%20Air%20Noise%20Light%20Protocol.pdf>; Center for Biological Diversity, Dirty Dozen: The 12 Most Commonly Used Air Toxics in Unconventional Oil Development in the Los Angeles Basin (Sept. 2013).

¹⁶⁰ Macey, G.P. et al., Air Concentrations of Volatile Compounds Near Oil and Gas Production: A Community-Based Exploratory Study, 13 Environmental Health 82 (2014) at 1.

¹⁶¹ McCawley 2013.

¹⁶² Pétron, G. et al., Hydrocarbon Emissions Characterization in the Colorado Front Range – A Pilot Study, 117 J. Geophysical research D04304 (2012), at 8, 13 (“Pétron 2012”).

¹⁶³ Gilman, J.B. et al., *Source Signature of Volatile Organic Compounds from Oil and Natural Gas Operations in Northeastern Colorado*, 47 Env'tl. Sci & Tech. 1297, 1303 (2013).

¹⁶⁴ See, e.g., U.S. Environmental Protection Agency, Oil and Gas Sector: Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution: Background Technical Support Document for Proposed Standards at 3-6 (July 2011); Armendariz, Al, Emissions for Natural Gas Production in the Barnett Shale Area and Opportunities for Cost-Effective Improvements (2009) (“Armendariz”) at 24.

¹⁶⁵ Fiore, Arlene et al., Linking Ozone Pollution and Climate Change: The Case for Controlling Methane, 29 Geophys. Res Letters 19 (2002).

¹⁶⁶ U.S. Environmental Protection Agency, Oil and Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews Proposed Rule, 76 Fed. Reg 52,738 (Aug 23, 2011).

¹⁶⁷ Fiore, Arlene et al., Linking ozone pollution and climate change: The case for controlling methane, 29 Geophys. Res Letters 19 (2002); see also Martin, Randal et al., Final Report: Uinta Basin Winter Ozone and Air Quality Study Dec 2010 - March 2011 (2011) at 7.

Like methane, VOCs and NO_x are also ozone precursors; therefore, many regions around the country with substantial oil and gas operations are now suffering from extreme ozone levels due to heavy emissions of these pollutants.¹⁶⁸ Ozone can result in serious health conditions, including heart and lung disease and mortality.¹⁶⁹ A recent study of ozone pollution in the Uintah Basin of northeastern Utah, a rural area that experiences hazardous tropospheric ozone concentrations, found that oil and gas operations were responsible for 98 to 99 percent of VOCs and 57 to 61 percent of NO_x emitted from sources within the Basin considered in the study's inventory.¹⁷⁰

Oil and gas operations can also emit hydrogen sulfide. The hydrogen sulfide is contained in the natural gas and makes that gas "sour."¹⁷¹ Hydrogen sulfide may be emitted during all stages of operation, including exploration, extraction, treatment and storage, transportation, and refining. Long-term exposure to hydrogen sulfide is linked to respiratory infections, eye, nose, and throat irritation, breathlessness, nausea, dizziness, confusion, and headaches.¹⁷²

The oil and gas industry is also a major source of particulate matter. The heavy equipment regularly used in the industry burns diesel fuel, generating fine particulate matter¹⁷³ that is especially harmful.¹⁷⁴ Vehicles traveling on unpaved roads also kick up fugitive dust, which is particulate matter.¹⁷⁵ Further, both NO_x and VOCs, which as discussed above are heavily emitted by the oil and gas industry, are also particulate matter precursors.¹⁷⁶ Some of the health effects associated with particulate matter exposure are "premature mortality, increased hospital admissions and development of chronic respiratory disease."¹⁷⁷

Fracking results in additional air pollution that can create a severe threat to human health. One analysis found that 37 percent of the chemicals found at fracked gas wells were volatile, and

¹⁶⁸ Armendariz at 1, 3, 25-26; Wendy Koch, *Wyoming's Smog Exceeds Los Angeles' Due to Gas Drilling*, USA Today (May 9, 2011); Craft, Elena, Environmental Defense Fund, *Do Shale Gas Activities Play a Role in Rising Ozone Levels?* (2012); Colorado Dept. of Public Health and Environment, Conservation Commission, Colorado Weekly and Monthly Oil and Gas Statistics (July 6, 2012) at 12.

¹⁶⁹ U.S. Environmental Protection Agency, Integrated Science Assessment (ISA) for Ozone (O₃) and Related Photochemical Oxidants (2013).

¹⁷⁰ Lyman, Seth and Howard Shorthill, Final Report: 2012 Uintah Basin Winter Ozone & Air Quality Study, Utah Department of Environmental Quality (2013); *see also* Gilman, Jessica et al., Source signature of volatile organic compounds from oil and natural gas operations in northeastern Colorado, *Environ Sci and Technology* (Jan 14, 2013), DOI: 10.1021/es304119a.

¹⁷¹ Sierra Club Comments.

¹⁷² U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Report to Congress on Hydrogen Sulfide Air Emissions Associated with the Extraction of Oil and Natural Gas (EPA-453/R-93-045) at i (Oct. 1993) ("USEPA 1993").

¹⁷³ Earthworks, *Sources of Oil and Gas Pollution* (2011).

¹⁷⁴ Bay Area Air Quality Management District, *Particulate Matter Overview, Particulate Matter and Human Health* (2012).

¹⁷⁵ U.S. Environmental Protection Agency, Regulatory Impact Analysis for the Proposed Revisions to the National Ambient Air Quality Standards for Particulate Matter (June 2012), http://www.epa.gov/ttnecas1/regdata/RIAs/PMRIACombinedFile_Bookmarked.pdf at 2-2, ("EPA RIA").

¹⁷⁶ EPA RIA at 2-2.

¹⁷⁷ U.S. Environmental Protection Agency, National Ambient Air Quality Standards for Particulate Matter Proposed Rule, 77 Fed. Reg. 38,890, 38,893 (June 29, 2012).

that of those volatile chemicals, 81 percent can harm the brain and nervous system, 71 percent can harm the cardiovascular system and blood, and 66 percent can harm the kidneys.¹⁷⁸ Also, the SCAQMD has identified three areas of dangerous and unregulated air emissions from fracking: (1) the mixing of the fracking chemicals; (2) the use of the silica, or sand, as a proppant, which causes the deadly disease silicosis; and (3) the storage of fracking fluid once it comes back to the surface.¹⁷⁹ Preparation of the fluids used for well completion often involves onsite mixing of gravel or proppants with fluid, a process which potentially results in major amounts of particulate matter emissions.¹⁸⁰ Further, these proppants often include silica sand, which increases the risk of lung disease and silicosis when inhaled.¹⁸¹ Finally, as flowback returns to the surface and is deposited in pits or tanks that are open to the atmosphere, there is the potential for organic compounds and toxic air pollutants to be emitted, which are harmful to human health as described above.¹⁸²

The EIS should study the potential for oil and gas operations sites in the planning area to emit such air toxics and any other pollutants that may pose a risk to human health, paying particular attention to the impacts of air pollution on environmental justice communities that already bear the burden of disproportionately high levels of air pollution. The EIS should rely on the most up-to-date information regarding the contribution of oil and gas operations to VOC and air toxics levels.

B. Sources of Air Emissions

Harmful air pollutants are emitted during every stage of unconventional oil and gas recovery, including drilling, completion, well stimulation, production, and disposal. Drilling and casing the wellbore require substantial power from large equipment. The engines used typically run on diesel fuel, which emits particularly harmful types of air pollutants when burned. Similarly, high-powered pump engines are used in the fracturing and completion phase. This too can result in large volumes of air pollution. Flaring, venting, and fugitive emissions of gas are also a potential source of air emissions. Gas flaring and venting can occur in both oil and gas recovery processes when underground gas rises to the surface and is not captured as part of production. Fugitive emissions can occur at every stage of extraction and production, often leading to high volumes of gas being released into the air. Methane emissions from oil and gas production is as much as 270 percent greater than previously estimated by calculation.¹⁸³ Recent studies show that emissions from pneumatic valves (which control routine operations at the well

¹⁷⁸ Colborn 2011 at 8.

¹⁷⁹ South Coast Air Quality Management District, Draft Staff Report on Proposed Rule 1148.2 - Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers (January 2013).at 15 (“SCAQMD Revised Draft Staff Report PR1148-2”).

¹⁸⁰ *Id.*

¹⁸¹ South Coast Air Quality Management District, Response to Questions re Air Quality Risks of Hydraulic Fracturing in California, Submission to Joint Senate Hearing (2013) at 3.

¹⁸² SCAQMD Revised Draft Staff Report PR1148-2 at 15.

¹⁸³ Miller, S. M. et al. Anthropogenic Emissions of Methane in the United States, Proc. Natl. Acad. Sci. Early Edition, DOI: 10.1073/pnas.1314392110 (2013) (“Miller 2013”).

pad by venting methane during normal operation) and fugitive emissions are higher than EPA estimates.¹⁸⁴

Evaporation from pits can also contribute to air pollution. Pits that store drilling waste, produced water, and other waste fluid may be exposed to the open air. Chemicals mixed with the wastewater—including the additives used to make fracking fluids, as well as volatile hydrocarbons, such as benzene and toluene, brought to the surface with the waste—can escape into the air through evaporation. Some pits are equipped with pumps that spray effluents into the air to hasten the evaporation process. Even where waste fluid is stored in so-called “closed loop” storage tanks, fugitive emissions can escape from tanks.

As mentioned above, increased truck traffic will lead to more air emissions. Trucks capable of transporting large volumes of chemicals and waste fluid typically use large engines that run on diesel fuel. Air pollutants from truck engines will be emitted not only at the well site, but also along truck routes to and from the site.

C. Impact of Increased Air Pollution

The potential harms resulting from increased exposure to the dangerous air pollutants described above are serious and wide ranging. The negative effects of criteria pollutants are well documented and are summarized by the U.S. EPA’s website:

Nitrogen oxides (NO_x) react with ammonia, moisture, and other compounds to form small particles. These small particles penetrate deeply into sensitive parts of the lungs and can cause or worsen respiratory disease, such as emphysema and bronchitis, and can aggravate existing heart disease, leading to increased hospital admissions and premature death. NO_x and volatile organic compounds react in the presence of heat and sunlight to form ozone.

Particulate matter (PM) – especially fine particles – contains microscopic solids or liquid droplets that are so small that they can get deep into the lungs and cause serious health problems. Numerous scientific studies have linked particle pollution exposure to a variety of problems, including: premature death in people with heart or lung disease, increased mortality, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing.¹⁸⁵

¹⁸⁴ Allen, D. T. *et al.*, (2013), *Measurements of Methane Emissions at Natural Gas Production Sites in the United States*, 110 *Proc. Natl. Acad. Sci.* 44 (2013) (“Allen 2013”); Harriss, Robert *et al.*, Using Multi-Scale Measurements to Improve Methane Emission Estimates from Oil and Gas Operations in the Barnett Shale Region, Texas, *Environ. Sci. Technol.*, 2015, 49 (13), pp 7524–7526.

¹⁸⁵ U.S. Environmental Protection Agency, Particulate Matter, (PM) <http://www.epa.gov/airquality/particulatepollution/health.html> (accessed July 30, 2015); Ostro, Bart *et al.*, Long-term Exposure to Constituents of Fine Particulate Air Pollution and Mortality: Results from the California Teachers Study, 118 *Environmental Health Perspectives* 3 (2010).

Sulfur Dioxide (SO₂) has been shown to cause an array of adverse respiratory effects including bronchoconstriction and increased asthma symptoms.¹⁸⁶ Studies also show a connection between short-term exposure and increased visits to emergency departments and hospital admissions for respiratory illnesses, particularly in at-risk populations including children, the elderly, and asthmatics.¹⁸⁷

Carbon Monoxide (CO) can cause harmful health effects by reducing oxygen delivery to the body's organs (like the heart and brain) and tissues. At extremely high levels, CO can cause death.¹⁸⁸ Exposure to CO can reduce the oxygen-carrying capacity of the blood. People with several types of heart disease already have a reduced capacity for pumping oxygenated blood to the heart, which can cause them to experience myocardial ischemia (reduced oxygen to the heart), often accompanied by chest pain (angina), when exercising or under increased stress.¹⁸⁹ For these people, short-term CO exposure further affects their body's already compromised ability to respond to the increased oxygen demands of exercise or exertion.¹⁹⁰

Ozone (O₃) can trigger or worsen asthma and other respiratory ailments.¹⁹¹ Ground level ozone can have harmful effects on sensitive vegetation and ecosystems. Ozone may also lead to loss of species diversity and changes to habitat quality, water cycles, and nutrient cycles.

Air toxics and hazardous air pollutants, by definition, can result in harm to human health and safety. The full extent of the health effects of exposure is still far from being complete, but already there are numerous studies that have found these chemicals to have serious health consequences for humans exposed to even minimal amounts. The range of illnesses that can result are summarized in a study by Dr. Theo Colburn, which charts which chemicals have been shown to be linked to certain illnesses.¹⁹²

Natural gas drilling operations result in the emissions of numerous non-methane hydrocarbons (NMHCs) that have been linked to numerous adverse health effects. A recent study that analyzed air samples taken during drilling operations near natural gas wells and residential areas in Garfield County, Colorado, detected 57 chemicals between July 2010 and October 2011, including 44 with reported health effects.¹⁹³ For example:

¹⁸⁶ U.S. Environmental Protection Agency, Sulfur Dioxide <http://www.epa.gov/airquality/sulfurdioxide/health.html>, available at (accessed July 29, 2015).

¹⁸⁷ *Id.*

¹⁸⁸ U.S. Environmental Protection Agency, Carbon Monoxide, available at <http://www.epa.gov/airquality/carbonmonoxide/health.html> (accessed July 29, 2015).

¹⁸⁹ *Id.*

¹⁹⁰ *Id.*

¹⁹¹ U.S. Environmental Protection Agency, Ground Level Ozone, available at <http://www.epa.gov/airquality/ozonepollution/health.html> (accessed July 29, 2015).

¹⁹² Colborn, Theo et al., Natural Gas Operations from a Public Health Perspective, 17 Human and Ecological Risk Assessment 1039 (2011) ("Colborn 2011"); Colborn, Theo, et al., An Exploratory Study of Air Quality near Natural Gas Operations, Human and Ecological Risk Assessment: An International Journal doi:10.1080/10807039.2012.749447 (2012) ("Colborn 2012"); see note 120 & accompanying text below.

¹⁹³ Colborn et al., An Exploratory Study of Air Quality Near Natural Gas Operations, 20 Human and Ecological Risk Assessment: An International Journal. 1, 21-22 (2012) (pages refer to page numbers in attached manuscript and not journal pages) ("Colborn 2012"), available at <http://www.tandfonline.com/doi/full/10.1080/10807039.2012.749447>.

Thirty-five chemicals were found to affect the brain/nervous system, 33 the liver/metabolism, and 30 the endocrine system, which includes reproductive and developmental effects. The categories with the next highest numbers of effects were the immune system (28), cardiovascular/blood (27), and the sensory and respiratory systems (25 each). Eight chemicals had health effects in all 12 categories. There were also several chemicals for which no health effect data could be found.¹⁹⁴

The study found extremely high levels of methylene chloride, which may be used as cleaning solvents to remove waxy paraffin that is commonly deposited by raw natural gas in the region. These deposits solidify at ambient temperatures and build up on equipment.¹⁹⁵ While none of the detected chemicals exceeded governmental safety thresholds of exposure, the study noted that such thresholds are typically based on “exposure of a grown man encountering relatively high concentrations of a chemical over a brief time period, for example, during occupational exposure.”¹⁹⁶ Consequently, such thresholds may not apply to individuals experiencing “chronic, sporadic, low-level exposure,” including sensitive populations such as children, the elderly, and pregnant women.¹⁹⁷ For example, the study detected polycyclic aromatic hydrocarbon (PAH) levels that could be of “clinical significance,” as recent studies have linked low levels of exposure to lower mental development in children who were prenatally exposed.¹⁹⁸ In addition, government safety standards do not take into account “the kinds of effects found from low-level exposure to endocrine disrupting chemicals..., which can be particularly harmful during prenatal development and childhood.”¹⁹⁹

Another study reviewed exposures to emissions from unconventional natural gas development and noted that trimethylbenzenes are among the largest contributors to non-cancer threats for people living within a half mile of a well, while benzene is the largest contributor to cumulative cancer risk for people, regardless of the distance from the wells.²⁰⁰

D. Air Modeling

BLM should use air modeling to understand what areas and communities will most likely be affected by air pollution. It is crucial to gather independent data rather than relying on industry estimates, which may be inaccurate or biased. Wind and weather patterns, and atmospheric chemistry, determine the fate and transport of air pollution over a region, over time. The EIS should be informed by air modeling to show where the air pollution will flow.

V. BLM Must Take a Hard Look at how Fossil Fuel Development will Exacerbate Climate Change

¹⁹⁴ Colborn 2012, p. 11.

¹⁹⁵ *Id.*, p. 10.

¹⁹⁶ *Id.*, pp. 11-12.

¹⁹⁷ *Id.* p. 12.

¹⁹⁸ *Id.*, p. 10-11.

¹⁹⁹ *Id.*, p. 12.

BLM must take a hard look, pursuant to NEPA, at the mounting evidence proving that oil and gas operations are a major cause of climate change. This is due to emissions from the operations themselves, and emissions from the combustion of the oil and gas produced. Every step of the lifecycle process for development of these resources results in significant carbon emissions, including but not limited to:

End-user oil and gas combustion emissions. The combustion of extracted oil and gas will add vast amounts of carbon dioxide to the atmosphere, further heating the climate and moving the Earth closer to catastrophic and irreversible climate change. Though much of the oil is used as gasoline to fuel the transportation sector, the produced oil may also be used in other types of products. The EIS should study all end-uses as contributors to climate change.

Combustion in the distribution of product. To the extent that distribution of raw and end-use products will rely on rail or trucks, the combustion of gasoline or diesel to transport these products will emit significant greenhouse gas emissions.

Emissions from Refineries and Production. Oil and gas must undergo intensive refinery and production processes before the product is ready for consumption. Refineries and their auxiliary activities constitute a significant source of emissions.

Vented emissions. Oil and gas wells may vent gas that flows to the surface at times where the gas cannot otherwise be captured and sold. Vented gas is a significant source of greenhouse gas emissions and can also pose a safety hazard.

Combustion during construction and extraction operations. Operators rely on both mobile and stationary sources of power to construct and run their sites. The engines of drilling or excavation equipment, pumps, trucks, conveyors, and other types of equipment burn large amounts of fuel to operate. Carbon dioxide, methane, and nitrous oxide (another potent greenhouse gas) are emitted from oxidized fuel during the combustion process. Engines emit greenhouse gases during all stages of oil and gas recovery, including drilling rig mobilization, site preparation and demobilization, completion rig mobilization and demobilization, well drilling, well completion (including fracking and other unconventional extraction techniques), and well production. Transportation of equipment and chemicals to and from the site is an integral part of the production process and contributes to greenhouse gas emissions. Gas flaring is another important source of carbon dioxide emissions. Significant sources of emissions in oil production include pneumatic devices, dehydrators and pumps, and compressors, and system upsets.²⁰¹

Fugitive emissions. Potent greenhouse gases can leak as fugitive emissions at many different points in the production process, especially in the production of gas wells. Recent studies suggest that previous estimates significantly underestimate leakage rates.²⁰² New research shows methane leakage from some gas wells may be as high at

²⁰¹ U.S. Environmental Protection Agency, National Gas STAR Program, Basic Information, Major Methane Emission Sources and Opportunities to Reduce Methane Emissions (“USEPA, Basic Information”).

²⁰² Brandt, A. R. *et al.*, *Methane leaks from North American natural gas systems*, 343 *Science* 733 (2014); Miller 2013.

17.3 percent.²⁰³ Moreover, new research has shown that unconventional gas wells are up to 2.7 times more likely than a conventional well to have a cement or casing impairment, which can lead to methane leaks.²⁰⁴ The intersection of new fractures with nearby abandoned wells can also result in methane migration to the surface.²⁰⁵ Leakage can also occur during storage, processing, and distribution to customers.²⁰⁶

Natural gas emissions are generally about 84 percent methane.²⁰⁷ Methane is a potent greenhouse gas that contributes substantially to global climate change. Its global warming potential is approximately 34 times that of carbon dioxide over a 100 year time frame and at least 86 times that of carbon dioxide over a 20 year time frame.²⁰⁸ Oil and gas operations release large amounts of methane. While the exact amount is not clear, EPA has estimated that “oil and gas systems are the largest human-made source of methane emissions and account for 37 percent of methane emissions in the United States and is expected to be one of the most rapidly growing sources of anthropogenic methane emissions in the coming decades.”²⁰⁹ That proportion is based on an estimated calculation of methane emissions, rather than measured actual emissions, which indicate that methane emissions may be much greater in volume than calculated.²¹⁰

Fracked wells leak an especially large amount of methane, with some evidence indicating that the leakage rate is so high that shale gas is worse for the climate than coal.²¹¹ In fact, a research team associated with the National Oceanic and Atmospheric Administration recently

²⁰³ Caulton, Dana R. et al., *Toward a Better Understanding and Quantification of Methane Emissions from Shale Gas Development*, 111 Proc. Natl. Acad. Sciences 17 (2014); Schneising, Oliver, et al., Remote Sensing of Fugitive Methane Emissions from Oil and Gas Production in North American Tight Geologic Formations, *Earth’s Future* 2, doi:10.1002/2014EF000265 (2014); Allen 2013; Zavala-Araizaa, Daniel et al., *Reconciling divergent estimates of oil and gas methane emissions*, 112 Proc. Natl. Acad. Sciences 51 (2015), available at www.pnas.org/cgi/doi/10.1073/pnas.1522126112 (leakage rate 1.5% of production in Barnett shale or twice EPA’s estimate); Vaidyanathan, G., *Bad news for the climate as methane leaks far surpass previous estimates*, E&E News (Dec. 8, 2015) (leakage rate in Barnett shale equal to annual emissions of 8,000 cars).

²⁰⁴ Ingraffea, Anthony R, et al., *Assessment and Risk Analysis of Casing and Cement Impairment in Oil and Gas Wells in Pennsylvania, 2000 – 2012*, 111 Proc. Natl. Acad. Sciences 30 (2014).

²⁰⁵ King, Pamela. *‘Frack hits’ provide pathways for methane migration study*, E&E News (Oct. 21, 2015).

²⁰⁶ Howarth, R. W. A bridge to nowhere: methane emissions and the greenhouse gas footprint of natural gas, *Energy Science and Engineering* 2014; 2(2): 47–60, 49 (“Howarth 2014”).

²⁰⁷ Brown Memo to EPA at 3; Power, Thomas, *The Local Impacts of Natural Gas Development in Valle Vidal, New Mexico*, University of Montana (2005) (“Power”).

²⁰⁸ Intergovernmental Panel on Climate Change, Chapter 8: Anthropogenic and Natural Radiative Forcing in Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Table 8.7 (2013); Howarth, Robert, et al., Methane and the greenhouse-gas footprint of natural gas from shale formations, *Climatic Change* (Mar. 31, 2011) (“Howarth 2011”); Shindell, Drew, *Improved Attribution of Climate Forcing to Emissions*, 326 *Science* 716 (2009).

²⁰⁹ USEPA, Basic Information; see also Petron, Gabrielle, et al., *Hydrocarbon emissions characterization in the Colorado Front Range: A pilot study*, 117 *Journal of Geophysical Research* (2012).

²¹⁰ Miller 2013.

²¹¹ Howarth 2011; Brune, Michael, Statement of Sierra Club Executive Director Michael Brune Before the Committee on Oversight & Government Reform (May 31, 2012); Wang, Jinsheng, et al., Reducing the Greenhouse Gas Footprint of Shale (2011); Alvarez, Ramon et al., *Greater focus needed on methane leakage from natural gas infrastructure*, Proc. Nat’l. Acad. Sci. Early Edition (Feb 13, 2012) at 3; see also Howarth, Robert, et al., Venting and Leaking of Methane from Shale Gas Development: Response to Cathles et al., (2012); Hou, Deyi, et al., Shale gas can be a double-edged sword for climate change, *Nature Climate Change* at 386 (2012)

reported that preliminary results from a field study in the Uinta Basin of Utah suggest that the field leaked methane at an eye-popping rate of nine percent of total production.²¹²

The EIS must weigh the no-leasing and no-fracking alternatives' climate-change benefits against the impacts of allowing new leasing and fracking, and address the following:

1. *Sources of Greenhouse Gases*

In performing a full analysis of climate impacts, BLM must consider all potential sources of greenhouse gas emissions including those identified above (e.g. greenhouse gas emissions generated by transporting large amounts of water for fracking). BLM should also perform a full analysis of all gas emissions that contribute to climate change, including methane and carbon dioxide. The EIS should calculate the amount of greenhouse gas that will result on an annual basis from (1) each of the fossil fuels that can be developed within the planning area, (2) each of the well stimulation or other extraction methods that can be used, including, but not limited to, fracking, acidization, acid fracking, and gravel packing, and (3) cumulative greenhouse gas emissions expected over the long term (expressed in global warming potential of each greenhouse pollutant as well as CO₂ equivalent), including emissions throughout the entire fossil fuel lifecycle discussed above.

2. *Effects of Climate Change*

In addition to quantifying the total emissions that would result from the lease sale, an EIS should consider the environmental effects of these emissions, resulting from climate disruption's ecological and social effects.²¹³ Release of greenhouse gases (from extraction, leakage, and downstream combustion) is not merely a reasonably foreseeable consequence of fracking extraction, it is the necessary and intended consequence. CEQ and the courts have repeatedly cautioned federal agencies that they cannot ignore either climate change generally, or the combustion impacts of fossil fuel extraction in particular.²¹⁴

See our discussion above in Section I subsections "A" and "C" explaining the necessity of keeping federal fossil fuels in the ground and studying the impacts of greenhouse gases on climate change.

Although cost-benefit analysis is not necessarily the ideal or exclusive method for assessing contributions to an adverse effect as enormous, uncertain, and potentially catastrophic as climate change, BLM does have tools available to provide one approximation of external costs and has previously performed a "social cost of carbon" analysis in prior environmental

²¹² Tollefson, Jeff, *Methane leaks erode green credentials of natural gas*, Nature News (Jan 2, 2013).

²¹³ See Council on Environmental Quality, Revised Draft Guidance for Greenhouse Gas Emissions and Climate Change Impacts 11 (Dec. 18, 2014), available at

<https://www.whitehouse.gov/administration/eop/ceq/initiatives/nepa/ghg-guidance> (instructing agencies to consider indirect and connected actions, including "downstream" emissions). Although the CEQ guidance is still in draft form and not binding, it is arbitrary for agencies to ignore its reasoning without explanation.

²¹⁴ See 40 C.F.R. §§ 1508.7, 1508.8; *Center for Biological Diversity v. Nat'l Highway Transp. Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008); *Utahns for Better Transp. v. U.S. Dep't of Transp.*, 305 F.3d 1152, 1176 (10th Cir. 2002); *Dine Citizens Against Ruining Our Env't v. U.S. Office of Surface Mining*, 82 F.Supp.3d 1201, 1212-14 (D. Colo. 2015).

reviews.²¹⁵ Its own internal memo identifies one available analytical tool: “For federal agencies the authoritative estimates of [social cost of carbon] are provided by the 2013 technical report of the Interagency Working Group on Social Cost of Carbon, which was convened by the Council of Economic Advisers and the Office of Management and Budget.”²¹⁶ As explained in that report:

The purpose of the “social cost of carbon” (SCC) estimates presented here is to allow agencies to incorporate the social benefits of reducing carbon dioxide (CO₂) emissions into cost-benefit analyses of regulatory actions that impact cumulative global emissions. The SCC is an estimate of the monetized damages associated with an incremental increase in carbon emissions in a given year. It is intended to include (but is not limited to) changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change.²¹⁷

Further, other analytical tools exist to evaluate the cost of methane emissions.²¹⁸ EPA has peer reviewed and employed such a tool in its “Regulatory Impact Analysis of the Proposed Emission Standards for New and Modified Sources in the Oil and Natural Gas Sector.”²¹⁹

Leasing and development of unconventional wells could exact extraordinary financial costs to communities and future generations, setting aside the immeasurable loss of irreplaceable, natural values that can never be recovered. BLM must provide an accounting of these potential costs in an EIS.

²¹⁵ See *High Country Conserv'n Advocates v. United States Forest Serv.*, 2014 U.S. Dist. Lexis 87820 (D. Colo. 2014) (invalidating environmental assessment [“EA”] for improperly omitting social cost of carbon analysis, where BLM had included it in preliminary analysis); Taylor, P. “BLM crafting guidance on social cost of carbon -- internal memo,” Greenwire, April 15, 2015, available at <http://www.eenews.net/greenwire/stories/1060016810/>; BLM Internal Memo from Assistant Director of Resources and Planning Ed Roberson (“Roberson Internal Memo”), April 2015, available at http://www.eenews.net/assets/2015/04/15/document_gw_01.pdf (noting “some BLM field offices have included estimates of the [social cost of carbon] in project-level NEPA documents”) (accessed July 29, 2015); see also Council on Environmental Quality, Revised Draft Guidance for Greenhouse Gas Emissions and Climate Change Impacts, p. 18, available at www.whitehouse.gov/administration/eop/ceq/initiatives/nepa/ghg-guidance (accessed Jul 29, 2015) (quantitative analysis required if GHGs > 25k tons/yr).

²¹⁶ BLM, Roberson Internal Memo.

²¹⁷ See Interagency Working Group on Social Cost of Carbon, United States Government, Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis - Under Executive Order 12866, May 2013, available at https://www.whitehouse.gov/sites/default/files/omb/inforeg/social_cost_of_carbon_for_ria_2013_update.pdf (accessed July 29, 2015).

²¹⁸ See Marten A.L., Kopits K.A., Griffiths C.W., Newbold S.C., Wolverton A. 2014, online publication (2015, print publication). “Incremental CH₄ and N₂O mitigation benefits consistent with the US Government's SC-CO₂ estimates,” *Climate Policy* 15(2):272-298, abstract available at <http://www.tandfonline.com/doi/abs/10.1080/14693062.2014.912981>.

²¹⁹ See USEPA, Social Cost of Carbon, available at <http://www3.epa.gov/climatechange/EPAactivities/economics/scc.html> (noting application of social cost of methane supported by peer review); USEPA, Regulatory Impact Analysis of the Proposed Emission Standards for New and Modified Sources in the Oil and Natural Gas Sector, Ch. 4, available at http://www3.epa.gov/airquality/oilandgas/pdfs/og_prop_ria_081815.pdf.

VI. BLM Must Take a Hard Look at Impacts to Sensitive Species of Plants and Wildlife

The expansion of oil and gas development activities will harm wildlife through habitat destruction and fragmentation, stress and displacement caused by development-related activities (e.g., construction and operation activities, truck traffic, noise and light pollution), surface water depletion leading to low stream flows, water and air contamination, introduction of invasive species, and climate change. These harms can result in negative health effects and population declines. Studies and reports of observed impacts to wildlife from unconventional oil and gas extraction activities are summarized in the Center’s “Review of Impacts of Oil and Gas Exploration and Development on Wildlife,” submitted herewith.²²⁰ Because the allowance of destructive oil and gas extraction runs contrary to BLM’s policy of managing resources in a manner that will “protect the quality of...ecological...values” and “provide...habitat for wildlife,”²²¹ a no-fracking alternative minimizing industrial development and its harmful effects on wildlife must be considered.

A. Habitat Loss

Oil and gas development creates a network of well pads, roads, pipelines, and other infrastructure that lead to direct habitat loss and fragmentation, as well as displacement of wildlife from these areas due to increased human disturbance. Habitat loss occurs as a result of a reduction in the total area of the habitat, the decrease of the interior-to-edge ratio, isolation of one habitat fragment from another, breaking up of one habitat into several smaller patches of habitat, and decreasing the average size of a habitat patch. New research has revealed the extent of this habitat loss. For example, in the western United States, the amount of high-quality habitat for the pronghorn has shrunk drastically due to oil and gas development.²²²

²²⁰ See Center for Biological Diversity, Review of Impacts of Oil and Gas Exploration and Development Activity on Wildlife (June 20, 2015). This review presents the findings of numerous studies and reports on the impacts of hydraulic fracturing on wildlife.

²²¹ 43 U.S. Code § 1701(a)(8).

²²² Beckmann, J.P. et al. Human-mediated shifts in animal habitat use: Sequential changes in pronghorn use of a natural gas field in Greater Yellowstone, 147 Biological Conservation 1:222 (2012).

The indirect effects from unconventional oil and gas development can often be far greater than the direct disturbances to habitat. The impacts from the well site—including noise, light, and pollution—extend beyond the borders of the operation site and will consequently render even greater areas uninhabitable for some wildlife. Species dependent on having an “interior” habitat will lose their habitat as operation sites or other infrastructure fragment previously buffered and secluded areas. These and other indirect effects can be far greater than the direct disturbances to land. In the Marcellus shale of Pennsylvania, for instance, research shows that 8.8 acres of forest on average are cleared for each drilling pad along with associated infrastructure, but after accounting for ecological edge effects, each drilling station actually affected 30 acres of forest.²²³

While individual well sites may cause some disturbance and destruction, the cumulative impacts of oil and gas production using unconventional methods must receive attention as well. While the actual well pads may only occupy a small proportion of a particular habitat, their impact can be much greater when their aggregate impact is considered. As discussed above, interior habitats will be destroyed by removing the buffer between the interior habitat and the operation site. For example, one study found that grassland bird species’ habitat have been degraded by oil development in the Bakken shale region, as evidenced by their avoidance of these areas. Grassland birds avoided areas within 150 meters of roads, 267 meters of single-bore well pads, and 150 meters of multi-bore well pads.²²⁴ In areas of dense development, these habitat effects are greatly multiplied for sensitive species, such as the Sprague's pipit (*Anthus spragueii*), which avoided areas within 350 meters of single-bore well pads. The EIS must quantify the potential cumulative loss of habitat for sensitive species.²²⁵

B. Water Depletion

Water depletion also affects species whose habitats are far removed from the actual well site. Because of the high volume of water required for even a single well that uses unconventional extraction methods, the cumulative water depletion has a significant impact on species that rely on water sources that serve to supply oil and gas operations. In addition, water depletion adversely impacts water temperature and chemistry, as well as amplifies the effects of harmful pollutants on wildlife that would otherwise be diluted without the depletion.

C. Contamination from Wastewater Causing Harm and Mortality

Accidental spills or intentional dumping of wastewater contaminate surface water and cause large-scale harm to wildlife. Numerous incidents of wastewater contamination from pipelines, equipment blowouts, and truck accidents have been reported, and have resulted in kills of fish, aquatic invertebrates, and trees and shrubs, as well as negative health effects for wildlife

²²³ Johnson, N., Pennsylvania energy impacts assessment: Report 1: Marcellus shale natural gas and wind, Nature Conservancy – Pennsylvania Chapter (2010) at 10.

²²⁴Thompson, Sarah J. et al. Avoidance of unconventional oil wells and roads exacerbates habitat loss for grassland birds in the North American great plains, *Biological Conservation* 192 (2015) 82–90, *available at* https://www.researchgate.net/publication/282292567_Avoidance_of_unconventional_oil_wells_and_roads_exacerbates_habitat_loss_for_grassland_birds_in_the_North_American_great_plains.

²²⁵ *Id.*

and domestic animals. In 2013, a company admitted to dumping wastewater from fracking operations into the Acorn Fork Creek in Kentucky, causing a massive fish kill.²²⁶ Among the species harmed was the blackside dace, a threatened minnow species.²²⁷ An analysis of water quality of Acorn Creek and fish tissues taken shortly after the incident was exposed showed the fish displayed general signs of stress and had a higher rate of gill lesions, than fish in areas not affected by the dumping.²²⁸ The discharge of fracking wastewater into the Susquehanna River in Pennsylvania is suspected to be the cause of fish abnormalities, including high rates of spots, lesions, and intersex.²²⁹ In West Virginia, the permitted application of hydrofracturing fluid to an area of mixed hardwood forest caused extensive tree mortality and a 50-fold increase in surface soil concentrations of sodium and chloride.²³⁰

In addition, open air pits that store waste fluid pose risks for wildlife that may come into contact with the chemicals stored in the pits. Already, there have been several documented cases of animal mortality resulting from contact with pits. A field inspection of open pits in Wyoming found 269 bird carcasses, the likely cause of death being exposure to toxic chemicals stored in the open pits.²³¹ Open pits can also serve as breeding grounds for mosquitoes, which serve as a vector for West Nile virus, a threat to humans and animals alike. In Wyoming, an increase of ponds led to an increase of West Nile virus among greater sage-grouse populations.²³² Recently, new information has come to light that operators in California have been dumping wastewater into hundreds of unpermitted open pits.²³³ The EIS must take into account the impact of both unpermitted, illegal waste pits as well as those that are regulated.

Contaminants from spills not only directly harm species exposed to these contaminants but can enter the food chain and harm predators. A recent study found that in watersheds where hydraulic fracturing occurs, a top predator, riparian songbird in headwater systems, the Louisiana Waterthrush (*Parkesia motacilla*), accumulated metals associated with the fracking process. “In both the Marcellus and Fayetteville shale regions, barium and strontium were found at significantly higher levels in feathers of birds in sites with fracking activity than at sites

²²⁶ Vaidyanathan, G., *Fracking Spills Cause Massive Ky. Fish Kill*, E&E News, Aug. 29, 2013, <http://www.eenews.net/greenwire/2013/08/29/stories/1059986559> (accessed July 30, 2015).

²²⁷ *Id.*

²²⁸ Papoulias, D.M. and A.L. Velasco. Histopathological analysis of fish from Acorn Fork Creek, Kentucky, exposed to hydraulic fracturing fluid releases, 12 *Southwestern Naturalist* (Special Issue 4):92 (2013).

²²⁹ Piette, Betsy, BP Oil Spill, Fracking Cause Wildlife Abnormalities, *Workers World* (April 27, 2012) available at http://www.workers.org/2012/us/bp_oil_spill_fracking_0503/; Pennsylvania Fish & Boat Commission, Ongoing Problems with the Susquehanna River smallmouth bass, a Case for Impairment (May 23, 2012), www.fish.state.pa.us/newsreleases/2012press/senate_susq/SMB_ConservationIssuesForum_Lycoming.pdf

²³⁰ Adams, Mary Beth, Land Application of Hydrofracturing Fluids Damages a Deciduous Forest Stand in West Virginia, 40 *Journal of Environmental Quality* 1340 (2011).

²³¹ *See, e.g.*, Ramirez, P. Jr., Bird Mortality in Oil Field Wastewater Disposal Facilities, 46 *Environ Mgmt* 5: 820 (2010).

²³² Zou, Li et al., Mosquito Larval Habitat Mapping Using Remote Sensing and GIS: Implications of Coalbed Methane Development and West Nile Virus, 43 *J. Med. Entomol.* 5:1034 (2006) (“Zou 2006”).

²³³ Cart, Julie. *Hundreds of Illicit Oil Wastewater Pits Found in Kern County*, (Feb. 26, 2015), available at <http://www.latimes.com/local/lanow/la-me-ln-pits-oil-wastewater-20150226-story.html>.

without fracking.”²³⁴ While the study did not resolve the pathway for these metals entering the food chain, their findings suggested that “hydraulic fracturing may be contaminating surface waters and underscores the need for additional monitoring and study to further assess ecological and human health risks posed by the increasingly widespread development of unconventional sources of natural gas around the world.”²³⁵

D. Invasive Species

Invasive species may be introduced through a variety of pathways that would be increasingly common if oil and gas activity is allowed to expand. Machinery, equipment, and trucks moved from site to site can carry invasive plant species to new areas. In addition, materials such as crushed stone or gravel transported to the site from other locations may serve as a conduit for invasive species to migrate to the well site or other areas en route.

Aquatic invasive species may also spread more easily given the large amounts of freshwater that must be transported to accommodate new drilling and extraction techniques. These species may be inadvertently introduced to new habitats when water is discharged at the surface. Alternatively, hoses, trucks, tanks, and other water use equipment may function as conduits for aquatic invasive species to access new habitats.

E. Climate Change

Anthropogenic climate change poses a significant threat to biodiversity.²³⁶ Climate disruption is already causing changes in distribution, phenology, physiology, genetics, species interactions, ecosystem services, demographic rates, and population viability: many animals and plants are moving poleward and upward in elevation, shifting their timing of breeding and migration, and experiencing population declines and extinctions.²³⁷ Because climate change is occurring at an unprecedented pace with multiple synergistic impacts, climate change is predicted to significantly increase extinction risk for many species. The IPCC concludes that it is extremely likely that climate change at or above 4°C will result in substantial special

²³⁴ Latta, Steven C., et al., Evidence from two shale regions that a riparian songbird accumulates metals associated with hydraulic fracturing,” *Ecosphere* vol. 6(9), Article 144 (September 2015), available at <http://www.esajournals.org/doi/pdf/10.1890/ES14-00406.1>.

²³⁵ *Id.*

²³⁶ Warren, R. et al., Quantifying the benefit of early climate change mitigation in avoiding biodiversity loss, 3 *Nature Climate Change* 678 (2013) (“Warren 2013”).

²³⁷ Cahill, A.E. et al., How Does Climate Change Cause Extinction? *Proceedings of the Royal Society B*, doi:10.1098/rspb.2012.1890 (2012); Chen, I. et al., Rapid range shifts of species associated with high levels of climate warming, 333 *Science* 1024 (2011); Maclean, I.M.D., and R.J. Wilson, Recent ecological responses to climate change support predictions of high extinction risk, 108 *Proc. Natl. Acad. Sci. Early Edition* 12337 (2011) (“Maclean and Wilson 2011”); Parmesan, C., *Ecological and Evolutionary Responses to Recent Climate Change*, 37 *Annual Review of Ecology Evolution & Systematics* 637 (2006); Parmesan, C., and G. Yohe, A globally coherent fingerprint of climate change impacts across natural systems, 421 *Nature* 37 (2003); Root, T.L. et al., Fingerprints of Global Warming on Wild Animals and Plants, 421 *Nature* 57 (2003); Warren, Rachel et al., Increasing Impacts of Climate Change Upon Ecosystems with Increasing Global Mean Temperature Rise, 106 *Climatic Change* 141 (2011). (“Warren 2011”).

extinction.²³⁸ Other studies have predicted similarly severe losses: 15-37 percent of the world's plants and animals committed to extinction by 2050 under a mid-level emissions scenario²³⁹; the extinction of 10 to 14 percent of species by 2100 if climate change continues unabated.²⁴⁰ Another recent study predicts the loss of more than half of the present climatic range for 58 percent of plants and 35 percent of animals by the 2080s under the current emissions pathway, in a sample of 48,786 species.²⁴¹ Because expansion of oil and gas production in the planning area will substantially increase the emissions of greenhouse gases, this activity will further contribute to the harms from climate change to wildlife and ecosystems.

F. Population-Level Impacts

Oil and gas development has been linked to population-level impacts on wildlife, including lower reproductive success of sage grouse and declines in the abundance of songbirds and aquatic species. For example, young greater-sage grouse avoided mating near infrastructure of natural-gas fields, and those that were reared near infrastructure had lower annual survival rates and were less successful at establishing breeding territories compared to those reared away from infrastructure.²⁴² In Wyoming, an increasing density of wells was associated with decreased numbers of Brewer's sparrows, sage sparrows, and vesper sparrows.²⁴³ In the Fayetteville Shale of central Arkansas, the proportional abundance of sensitive aquatic taxa, including darters, was negatively correlated with gas well density.²⁴⁴ The EIS must consider the population-level impacts that oil and gas development may have on wildlife in the planning areas.

G. Endangered, Threatened, and Sensitive Species

BLM must use the existing readily available data to identify which endangered, threatened, or sensitive species that are of critical concern with regards to the lands included in, or in immediate proximity to, the proposed sale parcels. In addition, BLM must consult with the Service regarding the impacts of the lease sale on affected listed species, in compliance with its section 7 obligations under the ESA. To the extent that BLM relies on its section 7 programmatic consultations for the several management plans governing the lease sale, that reliance is not proper for any of the listed species affected by BLM's action. The potential for fracking and horizontal drilling and its associated impacts within the planning area constitutes "new information reveal[ing] effects of the [RMPs] that may affect listed species or critical habitat in a manner or to an extent not previously considered [in the prior section 7 programmatic

²³⁸ Intergovernmental Panel on Climate Change, *Climate Change 2014: Synthesis Report, Summary for Policy Makers IPCC Fifth Assessment Synthesis Report*, 18 (2014).

²³⁹ Thomas, C.D. et al., *Extinction Risk from Climate Change*, 427 *Nature* 8:145 (2004).

²⁴⁰ Maclean and Wilson 2011.

²⁴¹ Warren 2013.

²⁴² Holloran, M.J. et al., *Yearling Greater Sage-Grouse Response to Energy Development in Wyoming*, 74 *Journal of Wildlife Management* 1:65 (2010).

²⁴³ Gilbert, Michelle M. & Anna D. Chalfoun, *Energy Development Affects Populations of Sagebrush Songbirds in Wyoming*, 75 *The Journal of Wildlife Management* 4:816 (2011).

²⁴⁴ Green, Jessie J. et al., *Abstract: Examining Community Level Variables of Fishes in Relation to Natural Gas Development*, Southeastern Fishes Council, Annual Meeting Program, November 8 - 9, 2012, New Orleans, Louisiana (2012).

consultations].²⁴⁵ BLM must therefore reinitiate consultation on all of the planning documents for these areas. In any case, it must formally consult over the lease sale's potential adverse effects on listed species and consider the full scope of fracking and other drilling activities that could affect these species.

H. Metrics

BLM should conduct a full assessment of the direct and indirect impacts of unconventional oil and gas development activities on wildlife and ecosystems through a suite of comprehensive studies on all species and ecosystems that could be affected. The studies should be particularly detailed for federally and state listed species, federal and state candidates for listing, and state species of special concern. The studies should address the following impacts: (1) habitat loss, degradation, and fragmentation, including edge effects; (2) water depletion; (3) air and water contamination; (4) introduction of invasive species; (5) climate change impacts; (6) health and behavioral effects such as increased stress and changes in life history behaviors; (7) changes in demographic rates such as reproductive success and survival; and (8) potential for population-level impacts such as declines and extirpations. These studies should consider these harms individually and cumulatively.

VII. BLM Must Take a Hard Look at the Seismic Risks from Unconventional Extraction Techniques and Underground Wastewater Disposal

If oil and gas development is allowed to proliferate in the planning area, increased unconventional oil and gas extraction and underground waste injection will increase the risk of induced seismicity. Induced seismic events could damage or destroy property and cause injuries or even death, especially in a state where earthquakes are rare and communities are typically not prepared for them. A no-leasing-no-fracking alternative would minimize these risks, while continued leasing and unconventional well development would increase them.

Research has shown that in regions of the central and eastern United States where unconventional oil and gas development has proliferated in recent years, earthquake activity has increased dramatically.²⁴⁶ More than 300 earthquakes with magnitude (M) ≥ 3 occurred between 2010 through 2012, compared with an average of 21 per year between 1967 and 2000.²⁴⁷ Moreover, although earthquakes with magnitude (M) ≥ 5.0 are very uncommon east of the Rocky Mountains, the number per year recorded in the midcontinent increased 11-fold between 2008 and 2011, compared to 1976 to 2007.²⁴⁸ Mid-continent states experiencing elevated levels of seismic activity include Arkansas, Colorado, New Mexico, Ohio, Oklahoma, Texas, and Virginia.²⁴⁹

²⁴⁵ 50 CFR § 402.16(b).

²⁴⁶ Ellsworth, W.L. Injection-Induced Earthquakes, 341 *Science* 1225942 (2013) ("Ellsworth 2013"); Keranen, Katie et al., Potentially Induced Earthquakes in Oklahoma, USA: Links Between Wastewater Injection and the 2011 Mw5.7 Earthquake Sequence, *Geology* doi:10.1130/G34045.1 (March 26, 2013) ("Keranen 2013").

²⁴⁷ Ellsworth 2013.

²⁴⁸ Keranen 2013.

²⁴⁹ Ellsworth 2013.

Research has linked much of the increased earthquake activity and several of the largest earthquakes in the U.S. midcontinent in recent years to the disposal of wastewater into deep injection wells, which is well-established to pose a significant seismic risk.²⁵⁰ Much of the fracking wastewater is a byproduct of oil and gas production and is routinely disposed of by injection into wells specifically designed and approved for this purpose. The injected fluids push stable faults past their tipping points, and thereby induce earthquakes.²⁵¹ In 2015, a study published in *Science* found that, the unprecedented increase in earthquakes in the U.S. midcontinent began in 2009 has been caused by the instability caused by fluid injection wells associated with fracking waste disposal.²⁵² To put an exclamation point on this finding, a 4.7 magnitude earthquake struck northern Oklahoma that was felt in 7 additional states, leading the Oklahoma Geological Survey to reiterate the connection between disposal wells and earthquakes and to shut down the most high risk wells.²⁵³ Earthquakes at magnitudes (M) that are felt (M3 and M4) or destructive (M4 and M5) have been attributed to wastewater injection wells in at least five states - Arkansas, Colorado, Ohio, Oklahoma, and Texas. The largest of these was a M5.7 earthquake in Prague, Oklahoma, which was the biggest in the state's history, destroying 14 homes and injuring two people.²⁵⁴ Other large earthquakes attributed to wastewater injection include an M5.3 in Colorado,²⁵⁵ M4.9 in Texas,²⁵⁶ M4.7 in Arkansas,²⁵⁷ and M3.9 in Ohio.²⁵⁸

The proliferation of unconventional oil and gas development, including increases in extraction and injection, will increase earthquake risk in the areas for lease. Accordingly, the EIS must fully assess the risk of induced seismicity cause by all unconventional oil and gas extraction and injection activities, including wastewater injection wells.

The analysis should assess the following issues based on guidance from the scientific literature, the National Research Council,²⁵⁹ and the Department of Energy²⁶⁰:

²⁵⁰ *Id.*

²⁵¹ Lamont-Doherty Earth Observatory, Columbia University. Distant Quakes Trigger Tremors at U.S. Waste-Injection Sites, Says Study. July 11, 2013. Available at: <https://www.ldeo.columbia.edu/news-events/distant-quakes-trigger-tremors-us-waste-injection-sites-says-study>.

²⁵² M. Weingarten, S. Ge, J. W. Godt, B. A. Bekins, and J. L. Rubinstein. June 19, 2015. High-rate injection is associated with the increase in U.S. mid-continent seismicity. *Science*, VOL 348 ISSUE 6241, pages 1336-1340.

²⁵³ Chow, Lorraine. November 19, 2015. Strong Earthquake Rattles Oklahoma, Felt in 7 Other States. <https://ecowatch.com/2015/11/19/oklahoma-earthquake-fracking/>

²⁵⁴ Ellsworth 2013, Keranen 2013.

²⁵⁵ Rubinstein, J.L. et al., The 2001–present triggered seismicity sequence in the Raton Basin of southern Colorado/northern New Mexico, 104 *Bull. Seismol. Soc'y of America* 5 (2014).

²⁵⁶ Brown, W.A. et al. Abstract: Investigating the cause of the 17 May 2012 M4.8 earthquake near Timpson, East Texas, Abstract 84 *Seismol. Res. Lett* 374 (2013).

²⁵⁷ Horton, S., Disposal of Hydrofracking Waste Fluid by Injection into Subsurface Aquifers Triggers Earthquake Swarm in Central Arkansas with Potential for Damaging Earthquake, 83 *Seismol. Res. Lett.* 2 (2012).

²⁵⁸ Kim, Won-Young, Induced Seismicity Associated with Fluid Injection into a Deep Well in Youngstown, Ohio, 118 *J. of Geophys. Res.: Solid Earth* 3506 (February 1, 2013).

²⁵⁹ National Research Council, *Induced Seismicity Potential in Energy Technologies*. National Academies Press (2012).

²⁶⁰ U.S. Department of Energy, *Protocol for Addressing Induced Seismicity Associated with Enhanced Geothermal Systems*, DOE/EE-0662 (2012); U.S. Department of Energy, *Best Practices for Addressing Induced Seismicity Associated with Enhanced Geothermal Systems - Draft* (2013).

- (1) whether existing oil and gas wells and wastewater injection wells in the area covered by the RMP have induced seismic activity, using earthquake catalogs (which provide an inventory of earthquakes of differing magnitudes) and fluid extraction and injection data collected by industry;
- (2) the region's fault environment by identifying and characterizing all faults in these areas based on sources including but not limited to the USGS Quaternary Fault and Fold database and the most recent Colorado Geological Survey Fault Activity Map GIS layer. In its analysis, BLM should assess its ability to identify all faults in these areas, including strike-slip faults and deep faults that can be difficult to detect;
- (3) the background seismicity of oil- and gas-bearing lands including the history of earthquake size and frequency, fault structure (including orientation of faults), seismicity rates, failure mechanisms, and state of stress of faults;
- (4) the geology of oil- and gas-bearing lands including pore pressure, formation permeability, and hydrological connectivity to deeper faults;
- (5) the hazards to human communities and infrastructure from induced seismic activity; and
- (6) the current state of knowledge on important questions related to the risk and hazards of induced seismicity from oil and gas development activities, including:
 - (a) how the distance from a well to a fault affects seismic risk (i.e., locating wells in close proximity to faults can increase the risk of inducing earthquakes);
 - (b) how fluid injection and extraction volumes, rates, and pressures affect seismic risk;
 - (c) how the density of wells affects seismic risk (i.e., a greater density of wells affects a greater volume of the subsurface and potentially contacts more areas of a single fault or a greater number of faults);
 - (d) the time period following the initiation of injection or extraction activities over which earthquakes can be induced (i.e., studies indicate that induced seismicity often occurs within months of initiation of extraction or injection although there are cases demonstrating multi-year delays);
 - (e) how stopping extraction or injection activities affects induced seismicity (i.e., can induced seismicity be turned off by stopping extraction and injection and over what period, since studies indicate that there are often delays—sometimes more than a year—between the termination of extraction and injection activities and the cessation of induced earthquake activity);
 - (f) the largest earthquake that could be induced by unconventional oil and gas development activities in areas covered by the RMP, including earthquakes caused by wastewater injection; and

- (g) whether active and abandoned wells are safe from damage from earthquake activity over the short and long-term.

VIII. BLM Must Take a Hard Look at How Fossil Fuel Development Will Impact Land Use

Increased oil and gas extraction and production have the potential to dramatically and permanently change the landscape of the areas for lease, which are relatively pristine and are unspoiled by oil and gas development. Countless acres of land will likely be leveled to allow for the construction and operation of well pads and related facilities such as wastewater pits. Roads may have to be constructed or expanded to accommodate trucks transporting chemicals and the large quantities of water needed for some recovery methods. Transmission lines and other utilities may also be required. The need for new distribution, refining, or waste treatment facilities will expand industrial land use. With new roads and other industrial infrastructure, certain areas could open up to new industrial or extractive activities, permanently changing the character and use of the land.

The conversion of substantial acreages from rural or natural landscapes to industrial sites will also mar scenic views throughout the planning area. Given BLM's failure to ensure full reclamation of idle wells and the difficulty of restoring sites to their original condition, scenic resources may be permanently impaired.

IX. BLM Must Prepare an Environmental Impact Statement

For proposed "major Federal actions significantly affecting the quality of the human environment," agencies must prepare an EIS in which they consider the environmental impact of the proposed action and compare this impact with that of "alternatives to the proposed action." See 42 U.S.C. § 4332(2)(C); Pennaco Energy, Inc. v. United States DOI, 377 F.3d 1147, 1150 (10th Cir. 2004). To determine whether an action will have a significant environmental impact, BLM can first prepare an environmental assessment ("EA"). 40 C.F.R. §§ 1501.4, 1508.9; Ohio Valley Env'tl. Coal. v. Hurst, 604 F. Supp. 2d 860, 870 (S.D. W. Va. 2009) ("If the agency cannot readily determine whether an action will significantly affect the environment, then it must prepare an environmental assessment [] that discusses the proposed action, alternatives, and the environmental impacts of the proposed action and its alternatives."). If the EA reveals that the project will have a significant effect on the quality of the human environment, then BLM must prepare a detailed, written EIS. 42 U.S.C § 4332(2)(C).

In considering whether the lease sale would have significant effects on the environment, NEPA's regulations require BLM to evaluate ten factors regarding the "intensity" of the impacts. 40 C.F.R. § 1508.27(b). Any "one of these factors may be sufficient to require preparation of an EIS." Ocean Advocates, 402 F.3d at 865; Nat'l Parks & Conservation Ass'n, 241 F.3d at 731. Several of these "significance factors" are implicated in the lease sale and clearly warrant the preparation of an EIS:

The degree to which the effects on the quality of the human environment are likely to be highly controversial.

The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

The degree to which the proposed action affects public health or safety.

The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

40 C.F.R. § 1508.27(b)(4), (5), (2) & (9). *Center for Biological Diversity (“CBD”) v. Bureau of Land Management*, 937 F. Supp. 2d 1140 (N.D. Cal. 2013) (holding that BLM failed to properly address the significance factors regarding controversy and uncertainty that may have been resolved by further data collection (citing *Native Ecosystems Council v. U.S. Forest Serv.*, 428 F.3d 1233, 1240 (9th Cir. 2005))). Here, individually and considered as a whole, there is no doubt that significant effects may result from the lease sale; thus, NEPA requires that BLM prepare an EIS for the action.

A. The Effects on the Human Environment will be Highly Controversial

A proposal is highly controversial when “substantial questions are raised as to whether a project . . . may cause significant degradation” of a resource, *Nw. Env’tl. Def. Ctr. v. Bonneville Power Admin.*, 117 F.3d 1520, 1536 (9th Cir. 1997), or when there is a “substantial dispute [about] the size, nature, or effect of the” action. *Blue Mtns. Biodiversity*, 161 F.3d at 1212. A “substantial dispute exists when evidence, raised prior to the preparation of [a] . . . FONSI, casts serious doubt upon the reasonableness of an agency’s conclusions.” *Nat’l Parks & Conserv. Ass’n*, 241 F.3d at 736. When such a doubt is raised, “NEPA then places the burden on the agency to come forward with a ‘well-reasoned explanation’ demonstrating why those responses disputing the EA’s conclusions ‘do not . . . create a public controversy.’” *Id.*

Here, the controversy regarding the lease sale is fully evident. This comment letter provides abundant evidence that oil and gas operations can cause significant impacts to human health, water resources, air quality, imperiled species, and seismicity. The potential for these significant impacts to occur is particularly clear in light of the potential for fracking to result from the lease sale.

Fracking is among the top, if not the most controversial energy issue facing America today. The controversy spans the public arena, scientific discourse, local governments, and the halls of Congress. At the request of Congress, EPA is conducting a study into the effects of fracking on drinking and ground water.²⁶¹ Similarly, the New York Draft DEC concluded that the health and environmental risks from fracking supports its ban in New York State. More than 165,000 citizens signed anti-fracking petitions, calling for an immediate end to fracking of the

²⁶¹ U.S. Environmental Protection Agency, Plan to Study the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources (November 2011).

Mancos shale in Northwestern New Mexico's Greater Chaco area.²⁶² In addition to the presence of controversy, it is already evident, as discussed above, that fracking is harmful and that the level of controversy associated with fracking and its expansion in the planning area in association with the lease sale is sufficient to trigger the need for an EIS. 40 C.F.R. § 1508.27(b)(4).

B. The Lease Sale Presents Highly Uncertain or Unknown Risks

An EIS must also be prepared when an action's effects are "highly uncertain or involve unique or unknown risks." 40 C.F.R. § 1508.27(b)(5). Preparation of an EIS is "mandated where uncertainty may be resolved by further collection of data, or where the collection of such data may prevent speculation on potential . . . effects." *Native Ecosystems Council v. U.S. Forest Serv.*, 428 F.3d 1233, 1240 (9th Cir. 2005) (internal citations omitted); *see also Ctr. for Biological Diversity*, 937 F. Supp. 2d at 1159 ("BLM erroneously discounted the uncertainty from fracking that may be resolved by further data collection. 'Preparation [of an EIS] is mandated where uncertainty may be resolved by further collection of data, or where collection of such data may prevent speculation on potential effects.'") (quoting *Native Ecosystems Council*, 428 F.3d at 1240).

While it is clear that oil and gas activities can cause great harm, there remains much to be learned about the specific pathways through which harm may occur and the potential degree of harm that may result. Additional information is needed, for example, about possible rates of natural gas leakage, the potential for fluids to migrate through the ground in and around the parcels, and the potential for drilling to affect local faults. NEPA dictates that the way to address such uncertainties is through the preparation of an EIS.

C. The Lease Sale Poses Threats to Public Health and Safety

As discussed in great detail above, the oil and gas activities that may occur as a result of the lease sale could cause significant impacts to public health and safety. 40 C.F.R. § 1508.27(b)(2). Fracking would pose a grave threat to the region's water resources, harm air quality, pose seismic risks, negatively affect wildlife, and fuel climate change.

As a congressional report noted, oil and gas companies have used fracking products containing at least 29 products that are known as possible carcinogens, regulated for their human health risk, or listed as hazardous air pollutants.²⁶³ The public's exposure to these harmful pollutants alone would plainly constitute a significant impact. Operational accidents also pose a significant threat to public health. For example in August 2008, Newsweek reported that an employee of an energy-services company got caught in a fracking fluid spill and was taken to the emergency room, complaining of nausea and headaches.²⁶⁴ The fracking fluid was so toxic that it ended up harming not only the worker, but also the emergency room nurse who treated him.

²⁶² WildEarth Guardians, More than 165,000 Deliver a Message to New Mexico Politicians: Stop Fracking in the Greater Chaco (August 18, 2015), available at: http://www.wildearthguardians.org/site/News2?page=NewsArticle&id=11842&news_iv_ctrl=1194#.V2RN77srLIU

²⁶³ Waxman 2011b

²⁶⁴ Wiserman, Hannah, Untested Waters: the Rise of Hydraulic Fracturing in Oil and Gas Production and the Need to Revisit Regulation, *Fordham Env'tl. Law Rev.* 115 at 138-39 (2009).

Several days later, after she began vomiting and retaining fluid, her skin turned yellow and she was diagnosed with chemical poisoning.²⁶⁵ Furthermore, and as previously discussed, information continues to emerge on the risk of earthquakes induced by wastewater injected into areas near faults. It is undeniable that these earthquakes pose risks to the residents of the area.

The use of fracking fluid, which is likely to occur as a result of the lease sale, poses a major threat to public health and safety and therefore constitutes a significant impact. BLM therefore must evaluate such impacts in an EIS.

X. BLM Must Ensure That the Federal Land Policy and Management Act and the Mineral Leasing Act Are Not Violated

The Mineral Leasing Act (“MLA”) requires BLM to demand lessees take all reasonable measures to prevent the waste of natural gas. The MLA states:

All leases of lands containing oil or gas, made or issued under the provisions of this chapter, shall be subject to the condition that the lessee will, in conducting his explorations and mining operations, use all reasonable precautions to prevent waste of oil or gas developed in the land, or the entrance of water through wells drilled by him to the oil sands or oil-bearing strata, to the destruction or injury of the oil deposits.

30 U.S.C. § 225; *see also id.* § 187 (stating that for the assignment or subletting of leases that “[e]ach lease shall contain . . . a provision . . . for the prevention of undue waste”). This statutory mandate is unambiguous and must be enforced. *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 184 n.29 (1978) (stating that “[w]hen confronted with a statute which is plain and unambiguous on its face,” “it is not necessary to look beyond the words of the statute.”). As already discussed in previous sections, oil and gas operations emit significant amounts of natural gases, including methane and carbon dioxide, which can be easily prevented.²⁶⁶

Pursuant to the Federal Land Policy and Management Act (“FLPMA”), BLM must “take any action necessary to prevent unnecessary or undue degradation of the [public] lands.” 43 U.S.C. § 1732(b). Written in the disjunctive, BLM must prevent degradation that is “unnecessary” and degradation that is “undue.” *Mineral Policy Ctr. v. Norton*, 292 F.Supp.2d 30, 41-43 (D. D.C. 2003). The protective mandate applies to BLM’s planning and management decisions. *See Utah Shared Access Alliance v. Carpenter*, 463 F.3d 1125, 1136 (10th Cir. 2006) (finding that BLM’s authority to prevent degradation is not limited to the RMP planning process). Greenhouse gas pollution for example causes “undue” degradation. Even if the activity causing the degradation may be “necessary,” where greenhouse gas pollution is avoidable, it is still “unnecessary” degradation. 43 U.S.C. § 1732(b).

²⁶⁵ *Id.*

²⁶⁶ *See* U.S. Government Accountability Office, Federal Oil and Gas Leases, Opportunities Exist to Capture Vented and Flared Natural Gas, Which Would Increase Royalty Payments and Reduce Greenhouse Gases 20 (2010)

In addition to being harmful to human health and the environment, the emissions from oil and gas operations are also an undue and unnecessary waste and degradation of public lands. Consequently, BLM's proposed gas and oil lease sale violates FLPMA. *See* 43 U.S.C. § 1732(b).

Conclusion

Unconventional oil and gas development not only fuel the climate crisis but entail significant public health risks and harms to the environment. Accordingly, BLM should thoroughly analyze the alternative of no new fossil fuel leasing, and no fracking or other unconventional well stimulation methods within the FFO planning area. Thank you for your consideration of these comments. The Center and Sierra Club look forward to reviewing a legally adequate EIS for this proposed oil and gas leasing action.



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From: Michael Saul
To: [Klein, Ross](#)
Subject: Out of Office: Center for Biological Diversity & Sierra Club Scoping Comments re Feb 2017 Oil Gas Lease Sale Farmington Field Office
Date: Monday, June 20, 2016 6:47:04 PM

I will be out of the office on vacation June 20-24, largely without access to email. I'll be back in the office and will return emails on Monday, June 27.

From: mbetenso@blm.gov
Subject: GSENM Newsletter 5 - Preliminary Alternatives Comment Report
Date: Wednesday, June 22, 2016 5:43:33 PM
Attachments: [GSENM Newsletter 5.pdf](#)

The Bureau of Land Management (BLM) released the attached newsletter today to bring you up to date on the progress of Grand Staircase-Escalante National Monument's Livestock Grazing Monument Management Plan Amendment (MMP-A) and associated Environmental Impact Statement (EIS). The newsletter lays out the alternatives being analyzed in the draft EIS. These alternatives were developed and refined using feedback from the public and stakeholders, as well as the State of Utah, Kane and Garfield counties, American Indian tribes, and the National Park Service. The Preliminary Alternatives Comment Report, which addresses the comments received on the preliminary alternatives is now complete. Both documents are available for immediate download from our project website: <http://blm.gov/pgld>. The next comment period will open once the draft MMP-A/EIS is released in early 2016.

Thank you for your continued interest in the public lands.

--

Bureau of Land Management

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Grand Staircase-Escalante National Monument

Bureau of Land Management
US Department of the Interior

Livestock Grazing Plan Amendment EIS NEWSLETTER #5 - Alternatives Selected for Detailed Study June 2016

Dear Friends and Neighbors,

Thank you for your interest in Grand Staircase-Escalante National Monument's Livestock Grazing Monument Management Plan Amendment (MMP-A) and associated Environmental Impact Statement (EIS). The Bureau of Land Management (BLM) is preparing the MMP-A/EIS with assistance from several cooperating agencies.

We asked for your comments during the scoping period from December 2013 to January 2014, and again in January 2015. Then we developed preliminary draft alternatives and then further refined them using feedback from the public and stakeholders, as well as the State of Utah, Kane and Garfield counties, American Indian tribes, and the National Park Service. The BLM and cooperating agencies completed review of the preliminary alternatives, and have developed five distinct alternative grazing management strategies that will be analyzed in detail in the EIS. The alternatives consider different scenarios for managing livestock and improving land health in the planning area. They are briefly summarized here, and more information is available on the Monument's Livestock Grazing Plan Amendment website at <http://blm.gov/pgld>.

We wanted to make sure we heard what the public was saying, so we included two opportunities for public input. We've heard a full range of ideas related to livestock grazing: from closing the entire area for grazing to opening the entire area for grazing. BLM is required by law to use the best available science and policy to make decisions that are in the interest of all citizens of the United States.

We are not seeking further feedback at this time; however, the public will have an opportunity to comment when the draft EIS is released, currently planned for the end of 2016. The draft EIS will also provide analysis of each alternative.

Sincerely,



Cynthia Staszak
Monument Manager
Grand Staircase-Escalante National Monument

The BLM is an agency in the US Department of the Interior that manages approximately one-quarter billion acres – more than any other Federal agency. This land, known as the National System of Public Lands, is primarily located in 12 Western states, including Alaska. Approximately 27 million acres of BLM administered lands make up the collection of National Conservation Lands, also known as the National Landscape Conservation System. These include BLM

**NATIONAL
CONSERVATION
LANDS**

National Monuments, National Conservation Areas, Wilderness Areas, Wilderness Study Areas, and National Scenic and Historic Trails. The mission of the National Conservation Lands is to conserve, protect, and restore these nationally significant landscapes that are recognized for their outstanding cultural, ecological, and scientific values.

Planning Area Defined

The planning area includes all public lands within Grand Staircase-Escalante National Monument (GSENM) and public lands for which GSENM has livestock grazing administration responsibility. These include BLM-administered lands within GSENM and other public lands in parts of both the BLM Kanab and Arizona Strip Field Offices as well as lands managed by the National Park Service (NPS) in Glen Canyon National Recreation Area (Glen Canyon).

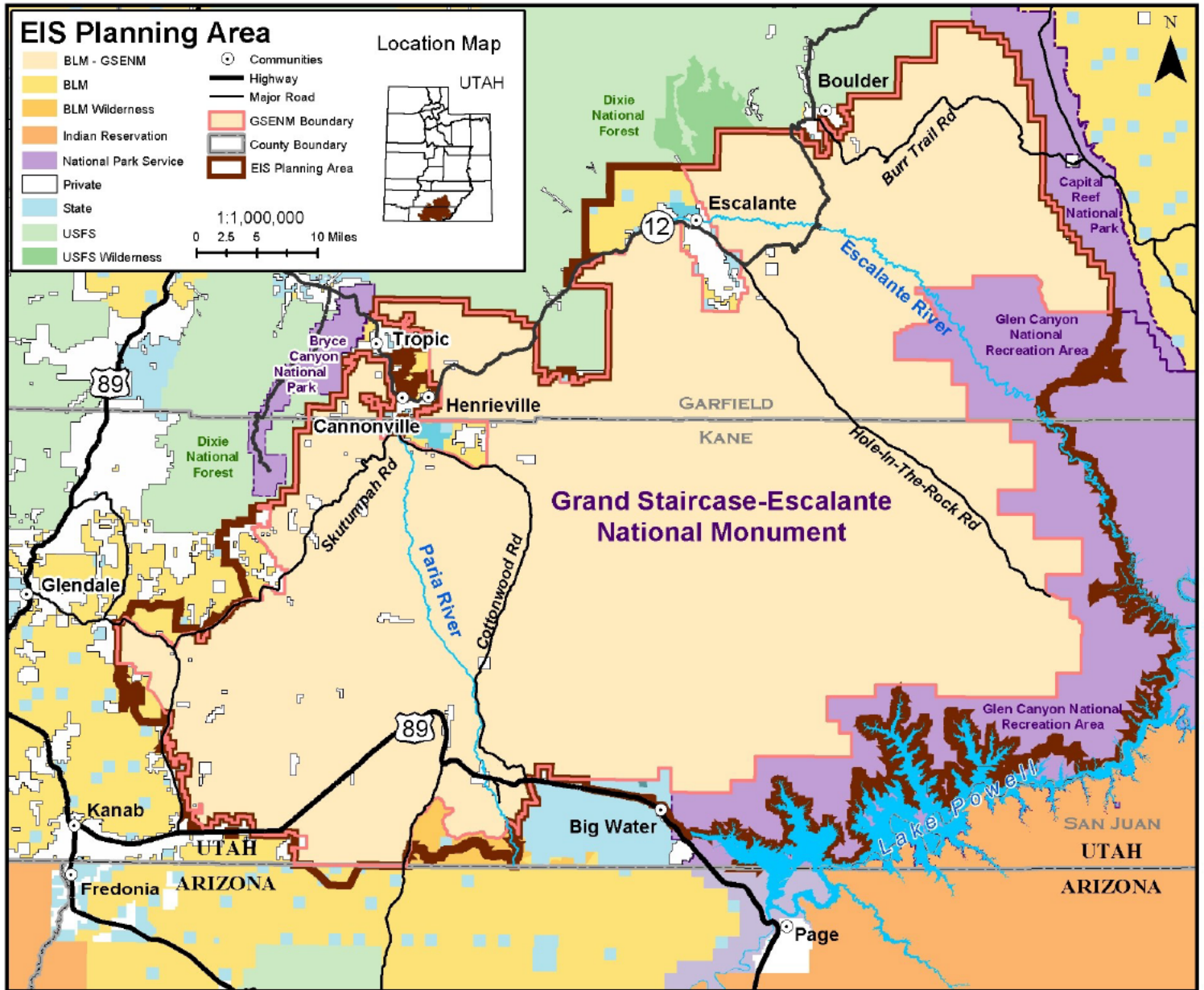
Agencies that have agreed to help manage the study include the NPS, the State of Utah, Garfield County, Kane County, and the Natural Resources Conservation Service. These cooperators have been working closely with BLM on every aspect of the study, including the alternative development process.

Cooperating Agencies Established

While the BLM has overall responsibility for the MMP-A/EIS, a number of other federal and local agencies have significant interest in this project. Several agencies and American Indian tribes were invited to participate as cooperating agencies.

Common Acronyms and Abbreviations

- AUM - Animal Unit Month
- BLM - Bureau of Land Management
- EIS - Environmental Impact Statement
- FLPMA - Federal Land Policy Management Act
- Glen Canyon - Glen Canyon National Recreation Area
- GSENM - Grand Staircase-Escalante National Monument
- MMP - Monument Management Plan
- MMP-A - Monument Management Plan Amendment
- NEPA - National Environmental Policy Act
- NPS - National Park Service



History & Background: What's Happened So Far?

Project Purpose and Need Defined

The plan amendment is focused on management of livestock grazing in and around GSENM. The plan will identify lands both available and unavailable for grazing. The amendment will also provide clearer guidelines for allotment management, prescribe the amount of forage available for livestock, and provide direction for other grazing practices as required by law and rule.

This plan amendment also intends to provide both BLM and ranchers the flexibility to adapt to new and emerging issues and opportunities for livestock grazing based on new information and monitoring.

Preliminary Alternative Grazing Management Strategies Developed

The National Environmental Policy Act (NEPA) requires that environmental and social impacts of federal actions are carefully examined and federal agencies develop a range of reasonable alternatives that “must be rigorously explored and objectively evaluated.” What constitutes a range of reasonable alternatives depends on the nature of the proposal and the facts in each case. People in this region care a great deal about how livestock grazing is managed, but opinions vary greatly. Studying a range of alternatives allows us to consider various ways to manage grazing and address other resource issues.

When we first started talking with local communities and interested stakeholders, some people called for the BLM to close the entire area to grazing while others wanted to open the entire area to livestock grazing. Because livestock grazing has been central to the local economy for more than 100 years, some people feel very strongly that it should continue uninterrupted, while others think that the protection of the natural, cultural and recreational resources of GSENM should take precedence over livestock grazing.

BLM’s overarching guidance, the Federal Land Policy Management Act, requires the BLM to balance livestock grazing with other uses. The alternatives selected for detailed study in the EIS reflect a range of opinions and approaches and were developed in consultation with the public and local governments.

Preliminary Alternatives Refined Through Public Input

Scoping is a public process that helps to frame the issues to be addressed through the EIS as well as the range of alternatives that might resolve those issues. Public scoping meetings and workshops were held in December 2013 and January 2014, and we



asked for additional input on the preliminary alternatives a year later. Public comments have been analyzed and included in the *Preliminary Alternatives Comment Report*. This report is available as a hardcopy at the BLM Office in Kanab (669 S. HWY 89A, Kanab, UT 84741) or in Escalante at the Interagency Visitor Center (755 W. Main, Escalante, UT, 84726). It is also available on the Monument project website at <http://blm.gov/pgld>.

Most comments BLM received related directly to livestock grazing and forage. We also heard concerns about impacts on soils, effects on the local economy and lifestyle of long-time ranchers, compatibility of grazing with recreation, and concerns about natural, biological, and cultural resources. Some people expressed concerns about GSENM “Objects ” (as identified in the Monument’s Proclamation), Glen Canyon “Values and Purposes,” noxious weeds and non-native invasive plants, historic and prehistoric resources, paleontological resources, public health and safety, tribal interests and American Indian religious concerns.

Over the past two and a half years, BLM has received a great deal of information from local residents and other stakeholders, including scientific studies, which are contributing to this effort.

Alternatives to be Studied in Detail in the EIS

Descriptions and comparisons of the preliminary alternatives were published in December 2014. The finalized alternatives are the same or very similar to the preliminary set. The five alternatives to be analyzed in detail in the EIS are briefly summarized here.



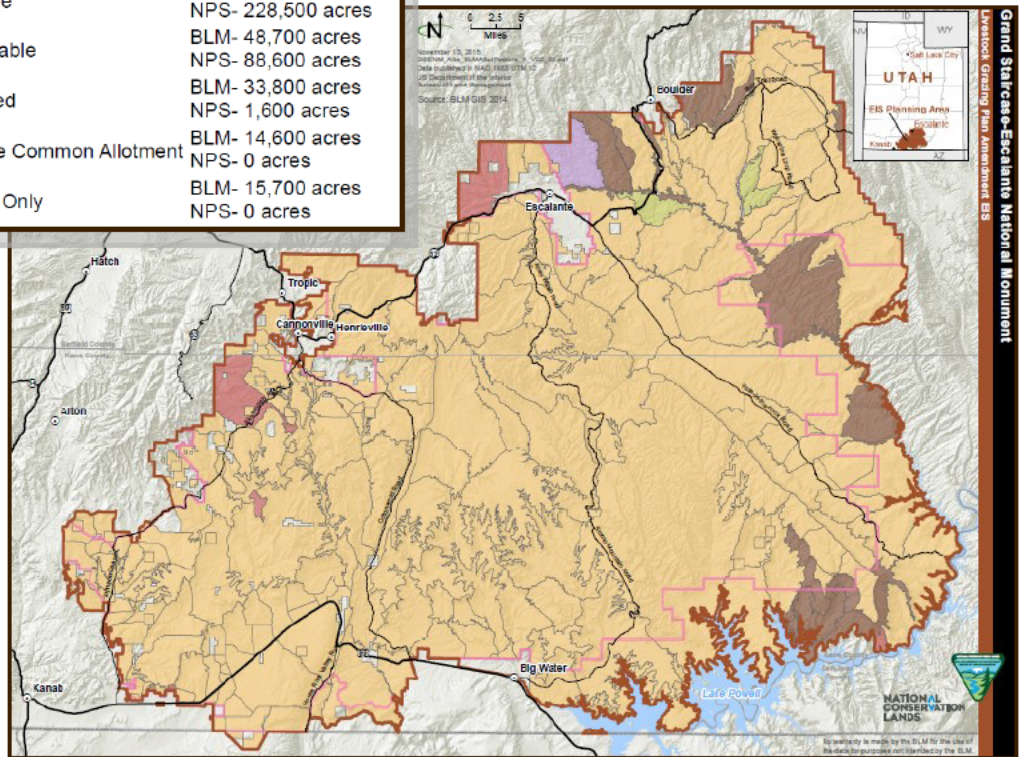
Changes and refinements that have occurred over the past year are **bolded** for comparison. The main changes have been made to Alternative C, which includes a greater initial reduction in livestock grazing than the preliminary alternative.

The five alternatives represent a broad range of options for analysis of impacts. For example, the acreage available for livestock grazing ranges from 0 to approximately 2,135,300 acres, and the associated animal unit months (AUMs) range from 0 to approximately 107,955. Areas closed to grazing for a variety of environmental and social reasons range from approximately 106,900 acres to 2,242,000 acres.

Alternative A

Alternative A is the “no action” alternative required to be analyzed by NEPA. Alternative A would continue the current management direction and level of grazing intensity contained in the 2000 Monument Management Plan, the four BLM Management Framework Plans, and the 1999 Grazing Management Plan for Glen Canyon. Livestock grazing would continue at current permitted levels and areas currently closed to livestock grazing would remain unavailable to grazing.

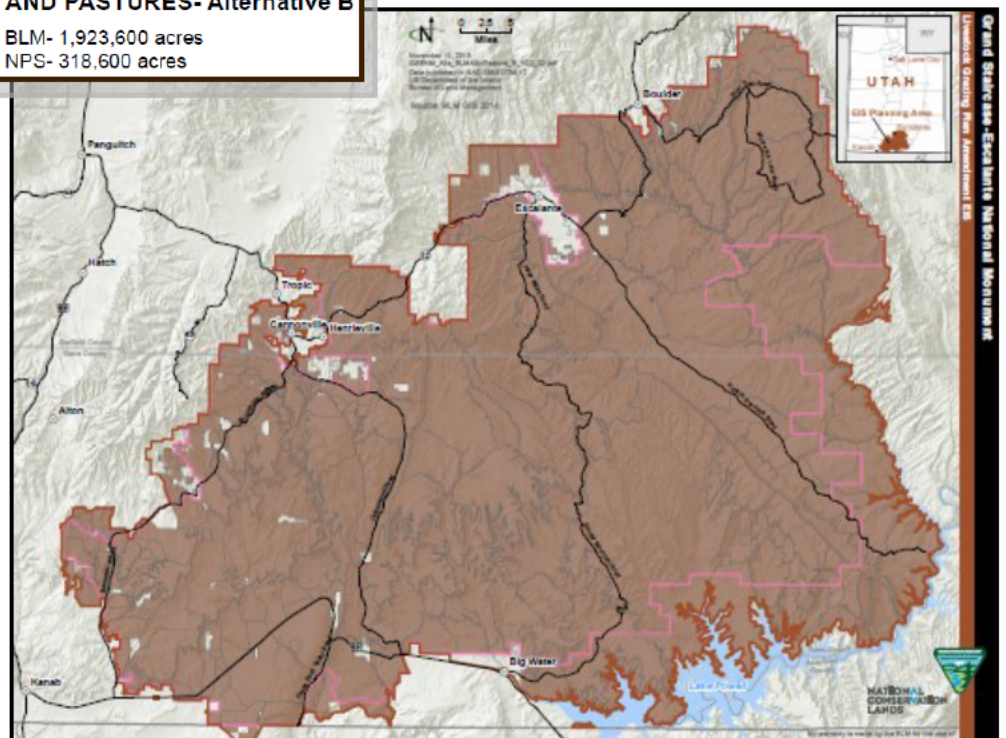
ALLOTMENTS AND PASTURES- Alternative A	
Available	BLM- 1,810,600 acres NPS- 228,500 acres
Unavailable	BLM- 48,700 acres NPS- 88,600 acres
Unallotted	BLM- 33,800 acres NPS- 1,600 acres
Reserve Common Allotment	BLM- 14,600 acres NPS- 0 acres
Trailing Only	BLM- 15,700 acres NPS- 0 acres



Alternative B

Alternative B was developed in response to public comments that suggested most or all of GSENM and Glen Canyon be closed to grazing due to perceived impacts on natural ecosystems, cultural resources, and recreation experiences. Under Alternative B, all livestock grazing would be discontinued in the planning area. Permittees would receive a two-year notification that livestock grazing would be discontinued and provided federal compensation for improvements within the allotments.

ALLOTMENTS AND PASTURES- Alternative B	
Unavailable	BLM- 1,923,600 acres NPS- 318,600 acres

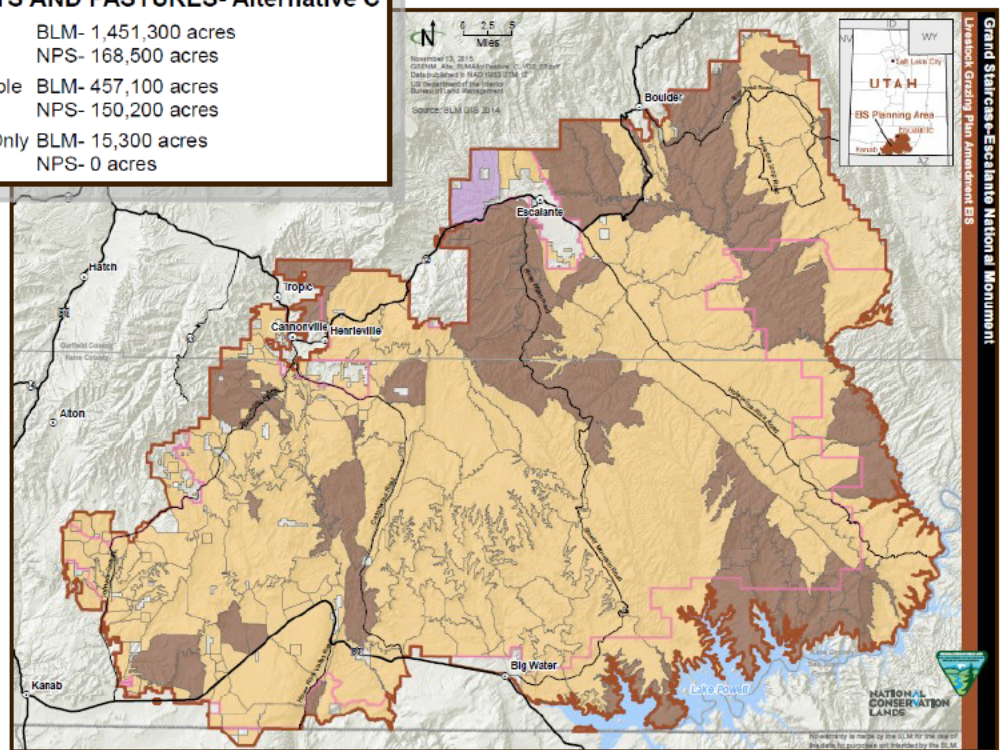




Alternative C

Alternative C was developed in response to public and stakeholder comments received during scoping. This alternative would reduce the total acres available for livestock grazing and the amount of forage allocated to livestock compared with current management. **The updated Alternative C includes more closures than those identified in the preliminary alternative. Initially, BLM would implement several large closures to address resource concerns in areas that do not meet rangeland health standards, have sensitive soils or biological soil crusts, and present major recreation conflicts. After the initial closures, a process of voluntary relinquishments or retirements would occur over time to achieve the objectives of this alternative.** These objectives include restoring areas that are not meeting rangeland health standards; establishing ungrazed reference areas for research, conserving sensitive Monument objects like biological soil crust, riparian areas, and native and special status species; protecting significant historic and prehistoric resources; preserving water quality; and reducing recreation conflicts. Alternative C would go beyond BLM's regular rangeland health standards by establishing additional criteria to manage livestock grazing. The alternative provides a mechanism to establish larger ungrazed "reference areas" over time in order to study ecosystem recovery in the absence of livestock grazing. This alternative would prioritize native species diversity, and thus, existing rangeland seedings would be restored for ecosystem health with a preference for locally derived native species. Areas that are currently unavailable and unallotted for grazing would remain that way. This alternative would resolve some conflicts by closing several high use recreation areas to livestock grazing.

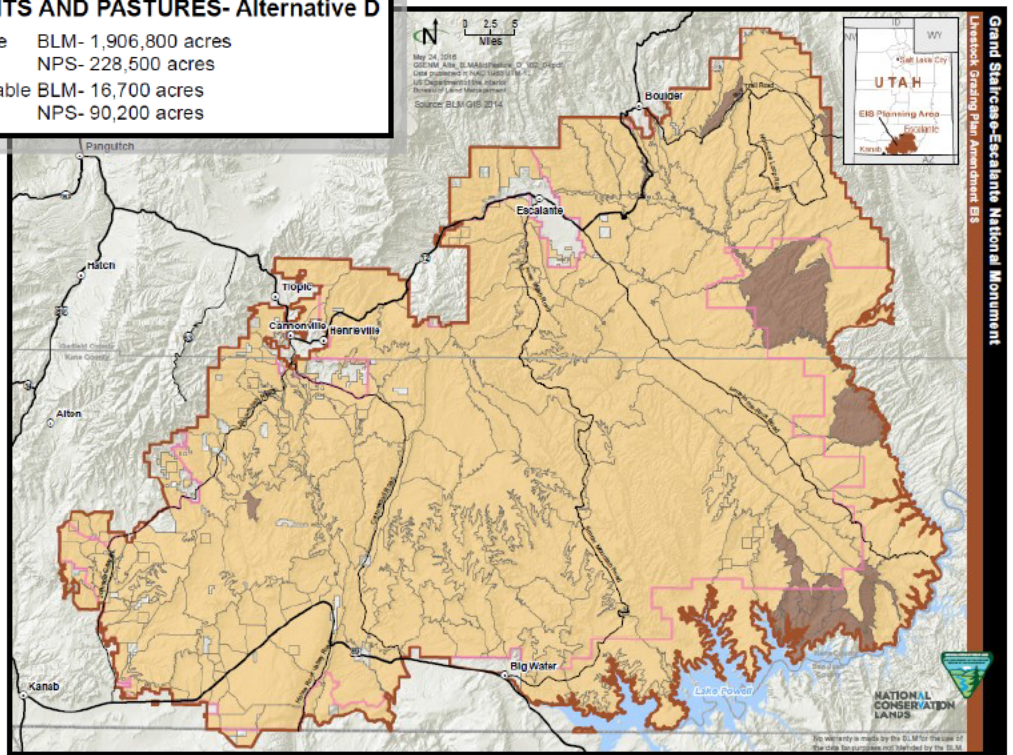
ALLOTMENTS AND PASTURES- Alternative C	
Available	BLM- 1,451,300 acres NPS- 168,500 acres
Unavailable	BLM- 457,100 acres NPS- 150,200 acres
Trailing Only	BLM- 15,300 acres NPS- 0 acres



Alternative D

Alternative D prioritizes the historic and cultural importance of the livestock industry while still supporting multiple uses. This alternative would promote rangeland health by developing additional range improvements. Public and local government comments emphasizing the importance of grazing to local communities helped develop this alternative. Alternative D would restore existing rangeland seedings **utilizing both native and non-native seed mixes and allow for additional rangeland seedings** using native seed and a variety of treatment methods and other range improvements to increase forage. Areas where livestock grazing conflicts exist would be addressed with a site specific solution (e.g., fencing or adjustment to season of use). More acres would be available and more forage would be allocated for livestock grazing (AUMs) compared with current livestock grazing levels.

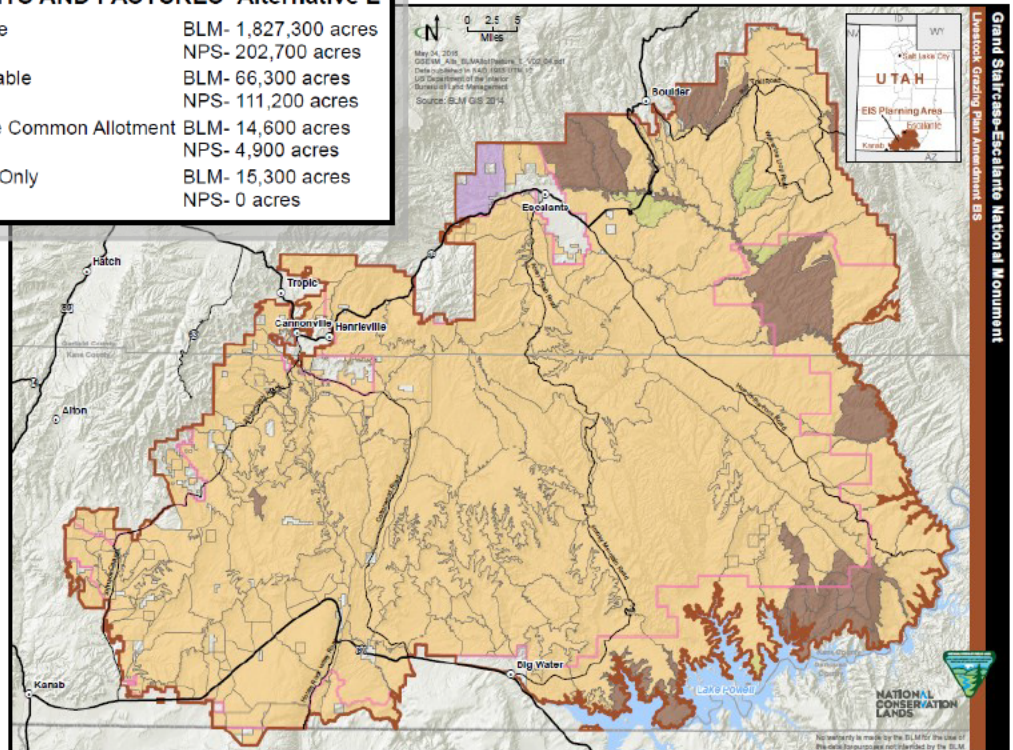
ALLOTMENTS AND PASTURES- Alternative D	
Available	BLM- 1,906,800 acres NPS- 228,500 acres
Unavailable	BLM- 16,700 acres NPS- 90,200 acres



Alternative E

Alternative E emphasizes sustainable use through livestock management designed to ensure that rangeland health standards are achieved. Most closed areas would remain unavailable except for two currently unavailable areas that would be made available. Some currently un-allotted areas would be made unavailable. Compared with current management, slightly fewer acres would be available for grazing and less forage allocated to livestock. Existing seedings would be restored for the purposes of ecosystem health and for forage production. Some livestock/recreation conflicts would be reduced by changing the season of use for livestock or limiting their access. Public and stakeholder comments largely contributed to developing this alternative.

ALLOTMENTS AND PASTURES- Alternative E	
Available	BLM- 1,827,300 acres NPS- 202,700 acres
Unavailable	BLM- 66,300 acres NPS- 111,200 acres
Reserve Common Allotment	BLM- 14,600 acres NPS- 4,900 acres
Trailing Only	BLM- 15,300 acres NPS- 0 acres



Evaluating Alternatives

These five alternatives will be analyzed in detail based on the physical, biological, economic, and social impacts of each one. The assessment will use the best available scientific data, comparative research, technical expertise, professional judgment, and socioeconomic information provided by stakeholders.

Factors that must be considered in the assessment of livestock grazing alternatives include:

- GSENM Proclamation-identified scientific and historic objects
- Resources and values for which Glen Canyon was established (public outdoor recreation use and enjoyment, scenic, scientific and historic features)
- Vegetation, including riparian vegetation, noxious weeds, or non-native plants
- Soils, including biological soil crusts
- Local custom and culture
- Regional economy
- Recreation
- Public health and safety

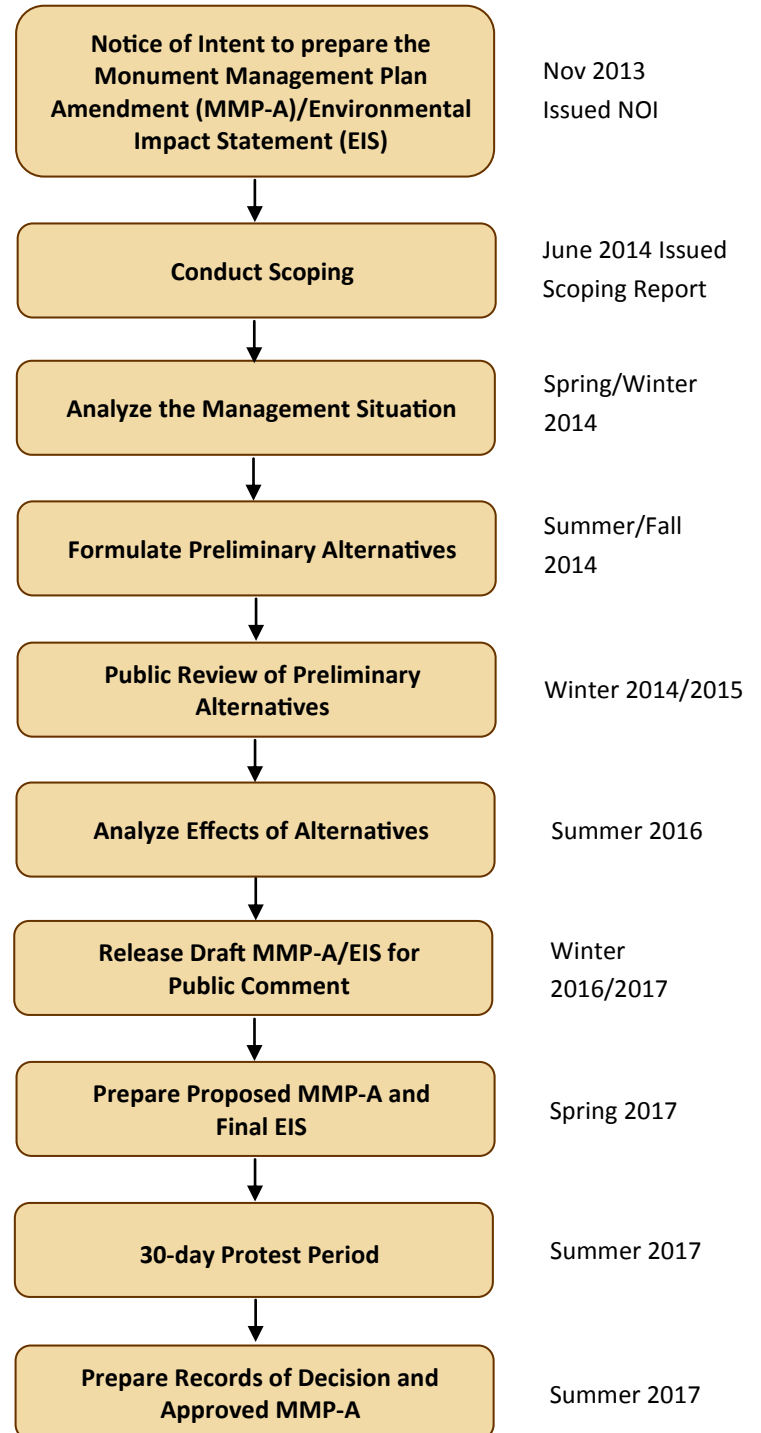
The impacts of changing climate and forage availability will be analyzed. BLM is also assessing impacts on water resources, air quality, fish and wildlife, special status species, cultural and paleontological resources, visual resources, wild and scenic rivers, tribal interests, and wilderness characteristics. BLM will look at the direct, indirect (future consequences), and cumulative (in combination with all other activities in the planning area) impacts of each alternative on these resources.

What's Next?

We expect to publish the Draft MMP-A/EIS by the end of 2016. BLM will announce its availability for public review and comment. BLM will also host public meetings to present the results, answer your questions, discuss the details, and hear your comments. You will have 90 days to provide comments. Public comments will be addressed in the Final MMP-A/EIS that will be completed after public review of the draft. The Final MMP-A/EIS will be the basis for the records of decision detailing the grazing management approach to be implemented. BLM will issue a record of decision for the BLM lands within the planning area, and NPS will issue a record of decision for lands within the planning area in Glen Canyon.



Livestock Grazing Plan Amendment Process





Grand Staircase-Escalante National Monument

Bureau of Land Management
US Department of the Interior

Livestock Grazing Plan Amendment EIS NEWSLETTER #5 - Alternatives Selected for Detailed Study June 2016



For more information, visit
the BLM's project website:
<http://blm.gov/pgld>

Newsletter #5

Livestock Grazing Plan Amendment/EIS

BLM Grand Staircase-Escalante National Monument

PENALTY FOR PRIVATE USE \$300

OFFICIAL BUSINESS

Kanab, UT 84741

669 South HWY 89A

Grand Staircase-Escalante National Monument

Bureau of Land Management

US Department of the Interior



From: Koski, Amber
To: jerry_cpaa@comcast.net; [Layne Miller](#); [Heidi Essex](#); [andy yench](#); <beecherllc@aol.com>; [Lisa Bryant](#); [Christopher Merritt](#); [Terry Fisk](#); [Julie Howard](#); jpatterson@montarch.com; [Jonathan Bailey](#); davidyoder@utah.gov; [Ryan Moreau](#); [Ray Peterson](#); [Steven Acerson](#); [Ahmed Mohsen](#); <steve@suwa.org>; [Jill Jensen](#); [Timothy Riley](#); [Nathan Thomas](#); [Jessica Montcalm](#); [John Hiscock](#); [Scott Groene](#); [Richard Jenkinson](#); [Mike Diem](#); [Kenny Wintch](#); [Curry, Kristine](#)
Subject: Fwd: Molen Reef Class I and II
Date: Monday, June 27, 2016 1:22:28 PM
Attachments: [MolenreefclassI_2016.PDF](#)
[15 BLM \(MOAC 15-079\) Molen Class II Project Resaerch Design Outline \(1\).docx](#)
[DOC020 \(1\).PDF](#)

Good morning,

Please find attached link for scheduling our kickoff meeting for the Molen Reef Class I & II.

A schedule will be forthcoming.

Thank you for your continued interest and support!

<http://doodle.com/poll/pme37bx988d2vhxv>

All the best,

Amber

----- Forwarded message -----
From: Koski, Amber <akoski@blm.gov>
Date: Mon, Jun 20, 2016 at 3:07 PM
Subject: Molen Reef Class I and II
To:

Greetings,

You have been identified as a potential consulting party for the Molen Reef Class I and II. Please find attached letter requesting that you/your organization provide a statement of your interest/expertise to participate as a consulting party as outlined by Section 106 of the National Historic Preservation Act for the Molen Reef Class I and II. We request that you respond within 30 days of this email.

For your review please find attached letter for the proposed class I and class II and research design outline. A copy of the research design will be available for your review by appointment only at the Price Field Office, Price, Utah

starting this week.

You/your organization must express their interest in participating as a consulting party prior to review of the research design.

If you have additional questions please feel free to contact me at 435-636-3618, or by electronic mail at akoski@blm.gov.

All the best,

Amber

--

Amber Koski, M.S.
Archaeologist
BLM-Price Field Office
125 South 600 West
Price, Utah 84501

Direct:435.636.3618
Office: 435.636.3600
Fax:435.636.3655
AKOSKI@BLM.GOV

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Archaeologist
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AKOSKI@BLM.GOV



United States Department of the Interior



BUREAU OF LAND MANAGEMENT
Green River District, Price Field Office
125 South 600 West
Price, UT 84501
<http://www.blm.gov/ut/st/en/fo/price.html>

IN REPLY REFER TO:
8100 UTU-1310 (UTG021)

RE: Proposed Class I and Class II for the Molen Reef area

Dear interested stake holder,

The Bureau of Land Management (BLM), Price Field Office (PFO) is currently developing a Class I existing information inventory and a Class II probabilistic field survey for the Molen Reef area. Based on the results of the Class I and Class II, an intensive pedestrian inventory of 500 acres will occur. Because repeated oil and gas lease with drawls have occurred in this area, a special emphasis will be placed on identifying site types and locations sensitive to full field development. In this case, the Class II will focus on identifying areas that may contain a high potential for rock art occurrence. The resulting inventory may be used to assist the BLM with their travel and transportation planning and for fluid mineral leasing, amongst other future planning efforts.

BLM Proposed Area of Potential Effect (APE) and Identification Efforts

Please find attached map for a visual description of the proposed direct and indirect APE for the Molen area.

For your review and comment please find the following enclosures:

- A Class I Inventory and Research Design for a Site Management Model of the Molen Geographic Region, Price Field Office, BLM

If your organization is interested in participating as a consulting party, please respond in writing within thirty days of this notice. Please be sure to include the following information along with your request:

1. Identify one or two individuals that will act as point of contact for the proposed project
2. Define what relevant information or expertise your organization will contribute to this project
3. Define when and how your organization will provide this information to the BLM
4. Consultants should expect to submit all relevant information within thirty days of this notice.

If you have questions regarding this project, please contact Amber Koski at (435) 636-3618, by electronic mail at akoski@blm.gov, or at the address listed above.

We appreciate the efforts of the Utah heritage community in helping BLM to meet its obligations to identify, evaluate, and protect historic properties. Thank you for your continuing assistance in these matters.

Sincerely,



Ahmed Mohsen
Field Manager

Enclosures (1) (outline)

- A Class I Inventory and Research Design for a Site Management Model of the Molen Geographic Region, Price Field Office, BLM

**Class II Probabilistic Field Survey for the
Molen Geographic Region,
Price Field Office,
BLM**

Research Design Outline

Prepared By:

Jody J. Patterson

Prepared For:

Bureau of Land Management
Price Field Office

Prepared Under Contract With:

Bureau of Land Management
Price Field Office

Prepared By:

Montgomery Archaeological Consultants, Inc.
P.O. Box 219
Moab, Utah 84532

MOAC Report No. 15-079

October 5, 2015

United States Department of Interior (FLPMA)
Permit No. 15-UT-60122

A. EXECUTIVE SUMMARY

- 1 *Purpose: To provide the foundation for the cultural resource planning models, the Class II survey and suggested management directions*
- 2 Identify General Questions and Issues
 - a. Define a research direction in consultation with the Field Office archaeologist to make more informed NRHP evaluations and adverse effect determinations (*main purpose of this outline*)
- 3 Identify Gaps in the Present Data
 - a. Where additional pedestrian inventory is needed to cover spatial inventory data gaps or data gaps in the archaeological record for the project area
- 4 Identify Priorities and Strategies for New Inventory
- 5 Identify Relevant CRM options
 - a. What are the areas that are more amenable or of more conflict to oil and gas development?
 - b. Are there areas, sites, or site types that should be identified for heightened levels of management to avoid or minimize direct or indirect effects.

B. RESEARCH DESIGN

- 1 Setting
 - a. Locational Setting
 - i. Geographical location
 1. Topography
 - ii. Physical description of individual ACECs
 1. Topography
 - b. Environmental/Ecological Setting
 - i. Geology
 1. Historical Geology
 2. Physical Geology
 3. Geomorphology
 4. Sediments/Soils
 - ii. Biology
 1. Wildlife
 2. Vegetation
 - iii. Climate
 1. Recent Trends
 2. Paleoclimate
 - iv. Hydrology

1. Springs
2. Seasonal Water
3. Permanent Water
- c. Cultural History/Literature Review
 - i. Paleoindian
 1. Huntington Mammoth
 2. Isolates
 - ii. Archaic
 1. Early
 2. Middle
 3. Late
 4. Terminal
 - a. Confluence
 - iii. Formative
 1. Fremont
 - a. Snake Rock,
 - b. Pediment sites
 - c. Hunting Canyon
 2. Pueblo
 - a. Regional Exchange
 - iv. Late Prehistoric/Protohistoric
 1. Numic
 - v. Historic
 1. Spanish Trail
 2. Settlement
 - vi. Modern Land Use
 1. Agriculture/Ranching
 2. Mining
 3. Oil and Gas
 - 4.
- 2 Existing Data Review
 - a. Previous Projects
 - b. Previous Sites
- 3 Research Questions
 - a. Resource Specific Questions
 - i. What suite of environmental variables best predict the location of rock art sites in the Molen area? Are different variable suites associated with different temporal periods or rock art styles?

- ii. Is there any spatial patterning in the distribution of particular rock art elements, themes, or styles?
 - iii. Are the rock art sites spatially autocorrected with other site types?
 - iv. Are the suites of variables for predicting site location different for sites without rock art?
 - v. Are environmental (e.g., certain rock formations) or cultural (e.g., proximity of rock art to habitation sites) more useful in predicting the location of rock art?
 - b. Site Eligibility Related Domains/Themes (to be determined upon completion of literature review)
 - i. Regional Interaction
 - 1. Research Questions
 - 2. Data Requirements
 - ii. Human Ecodynamics
 - 1. Research Questions
 - 2. Data Requirements
 - iii. Adaptive Systems
 - 1. Research Questions
 - 2. Data Requirements
 - c. Management Related Questions
 - i. How are rock art sites distributed relative to exploitable natural resources that may be developed in the immediate future (oil & gas, coal, etc.)?
 - ii. Are there commonalities between the anticipated location of archaeological sites, particularly rock art, and areas proposed for oil and gas development.
- 4 Cultural Resource Planning Model
 - a. Purpose
 - b. Data
 - i. Existing Site Location Data
 - ii. Initial Environmental Data
 - 1. Distance to Water
 - 2. Slope
 - 3. Aspect
 - 4. Rock Formations
 - 5. Vegetation
 - 6. Sediments/Soils
 - 7. Landscape metrics (?).
 - c. Methods

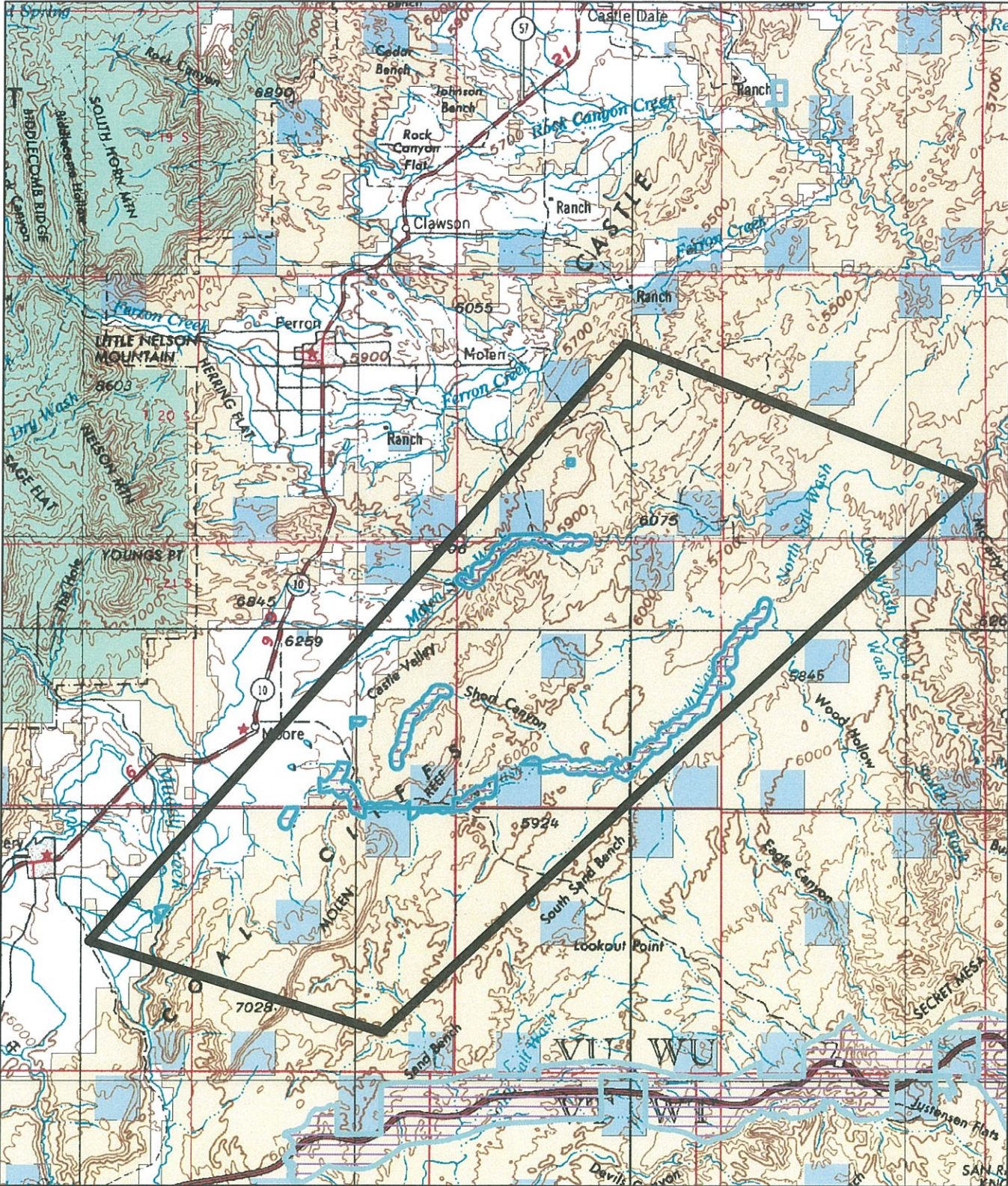
- i. Variable Selection
 - ii. Analytical Techniques
 - 1. Discriminant Analysis (if all data is continuous)
 - 2. Logistical Regression (if ordinal or nominal data is used)
- d. GIS Analyses
 - i. Raster Model Generation/Vector conversions (as necessary or appropriate)
 - ii. Spatial Associations
 - 1. Spatial Patterning
 - 2. Spatial Autocorrelation among various site types
 - iii. Comparison of Site Location Model to Developed Areas (mines ag. fields, towns, etc), ACECs, proposed and Anticipated Development Areas (Chi-square Overlay Analysis)
- e. Results
 - i. Model Results (Classification Results--Random and Leave One Out Classifications)
 - ii. Quantitative Geography and Overlay Results
 - iii. Identification of Survey Gaps
 - iv. Development Conflicts
- f. Class II Inventory- Sample Area Generation (With BLM)
 - i. Sample Strategy (Random, Judgmental, etc).
 - ii. Identify Areas with Significant Survey Gaps.
 - iii. Identify Areas of Potential Conflict

Molen Reef Project Overview

Emery County, Utah

Price Field Office

BLM



Legend

Land Status

- Bureau of Land Management (BLM)
- Private
- State
- US Forest Service (USFS)
- Area of Critical Environmental Concern (ACEC)



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.

PRICE FIELD OFFICE

From: Nada Culver
To: [Whitlock, Jenna](#)
Subject: New TWS report - No Exit - being released tomorrow
Date: Monday, June 27, 2016 3:48:49 PM
Attachments: [TWS No Exit Report-FinalDraft-6-23-16.pdf](#)

Hi Jenna– I wanted to let you know that The Wilderness Society is releasing a report tomorrow that proposes improvements to the BLM’s approach to planning for oil and gas leasing and development. We’ve often highlighted how the vast majority of public lands and minerals are available to leasing. This report includes some more research into how the agency’s guidance leads to that result, as well as the effects that has on planning and conservation, then provides recommendations as well.

This is our close to final draft and I will send a link to the final version and supporting materials tomorrow but wanted to make sure you saw it ahead of time.

Nada Culver

Senior Counsel and Director, BLM Action Center

The Wilderness Society

1660 Wynkoop, #850

Denver, CO 80202

Main: 303-650-5818

Direct: 303-225-4635

Nada_Culver@twso.org <mailto:Nada_Culver@twso.org>



FIXING THE BLM'S Indiscriminate Energy Leasing

Decades of adherence to the belief that all lands should be available for oil and gas leasing has kept our public lands from being protected and put them at unnecessary risk for destruction. It's time to update the BLM's approach and give the public more of a say in managing our public lands.

Introduction

This report describes how the U.S. government agency that oversees 700 million subsurface acres of oil and gas resources on nearly 250 million acres of public lands is saddled with outdated and unbalanced policies, often contradicting its own mandate to manage the land for multiple uses.

Ninety percent of the public lands managed by the Bureau of Land Management are open to open to oil and gas leasing and mineral resources even in areas with little or no potential for developing these resources, compromising potential for protecting wildlife and recreation, while encouraging speculative leasing.

The report provides a series of recommendations that would, if adopted by the BLM, lead to more

balanced decision-making. It lays out specific ways for the agency to better weigh the benefits of leasing a particular area with the potential harm. Such an approach would drive better decisions for the American people, the owners of U.S. public lands.

The Problem

The BLM is not fulfilling its duty to manage public lands for multiple uses.

The Bureau of Land Management rarely closes lands to oil and gas leasing in its resource management plans, despite the risk leasing poses to wildlife, cultural and other valuable resources. But this approach is in conflict with the agency's guiding management principle, the multiple use mandate.



Common sense would dictate that the BLM close areas with other important values than oil and gas potential, particularly areas unlikely to be developed. But the BLM's internal guidance, and the way that the agency interprets that guidance, has made it extremely difficult to actually close lands to leasing. Instead, the BLM continues to create opportunities for energy speculation at a high cost to recreation, wilderness and wildlife.

An examination of current BLM policies and management practices shows that there is little effort to protect at least some public lands from oil and gas leasing.¹

As a result, the vast majority of U.S. public lands (90 percent) are available for leasing—regardless of whether those lands have other important values that should be protected and regardless of whether the BLM's own data show there is low—or even no—potential for oil and gas. This fundamental flaw in the BLM's guidance has led to a current total of 32 million acres leased for oil and gas development, with less than 13 million under development.²

When public lands with low energy development potential are leased to oil and gas companies,

taxpayers lose out on revenue, as well as other important uses of these lands like recreation and wildlife management. In fact, a Congressional Budget Office report recently concluded that, for parcels leased between 1996 and 2003 (all of which have reached the end of their 10-year exploration period), only about 10 percent of onshore leases issued competitively and three percent of those issued noncompetitively actually entered production.³

The BLM needs to update its approach—it's time to bring 25-year-old policies into this century. In the short term this means issuing immediate guidance for protecting sensitive lands and lands with low energy development potential, and in the long term, commencing a formal revision to BLM's planning guidance.

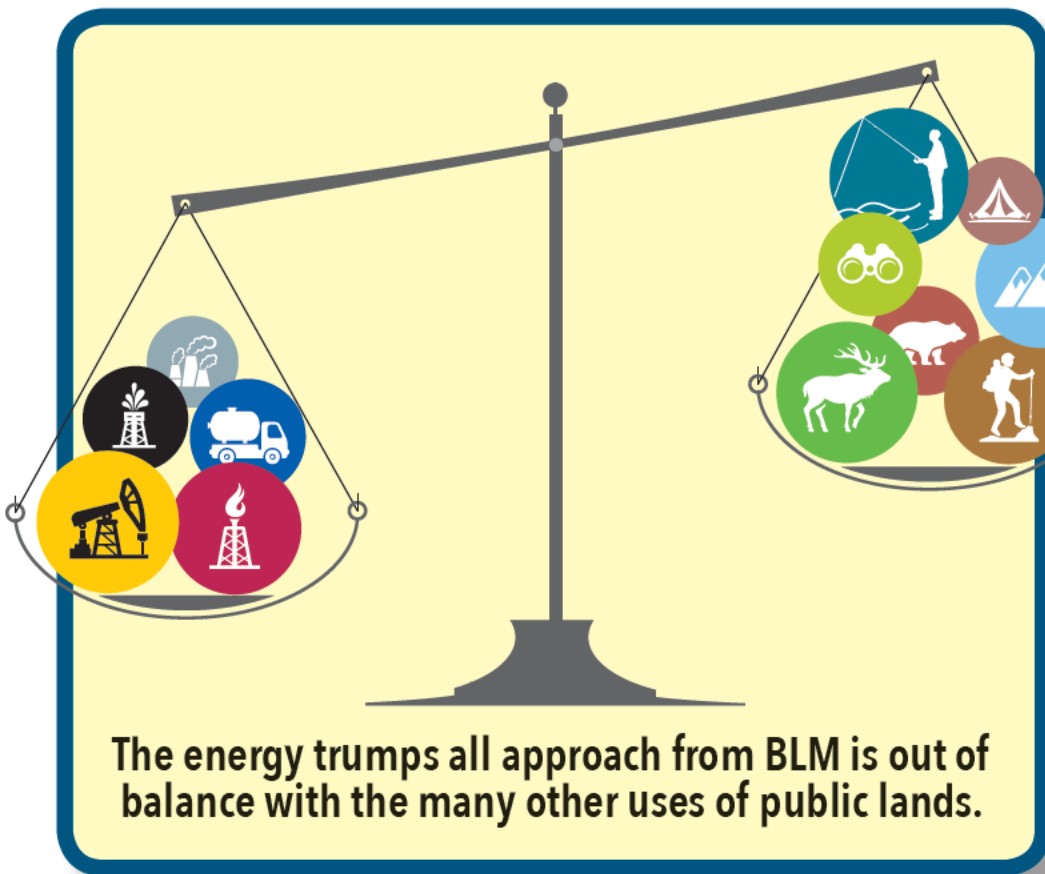
Misguided Guidance

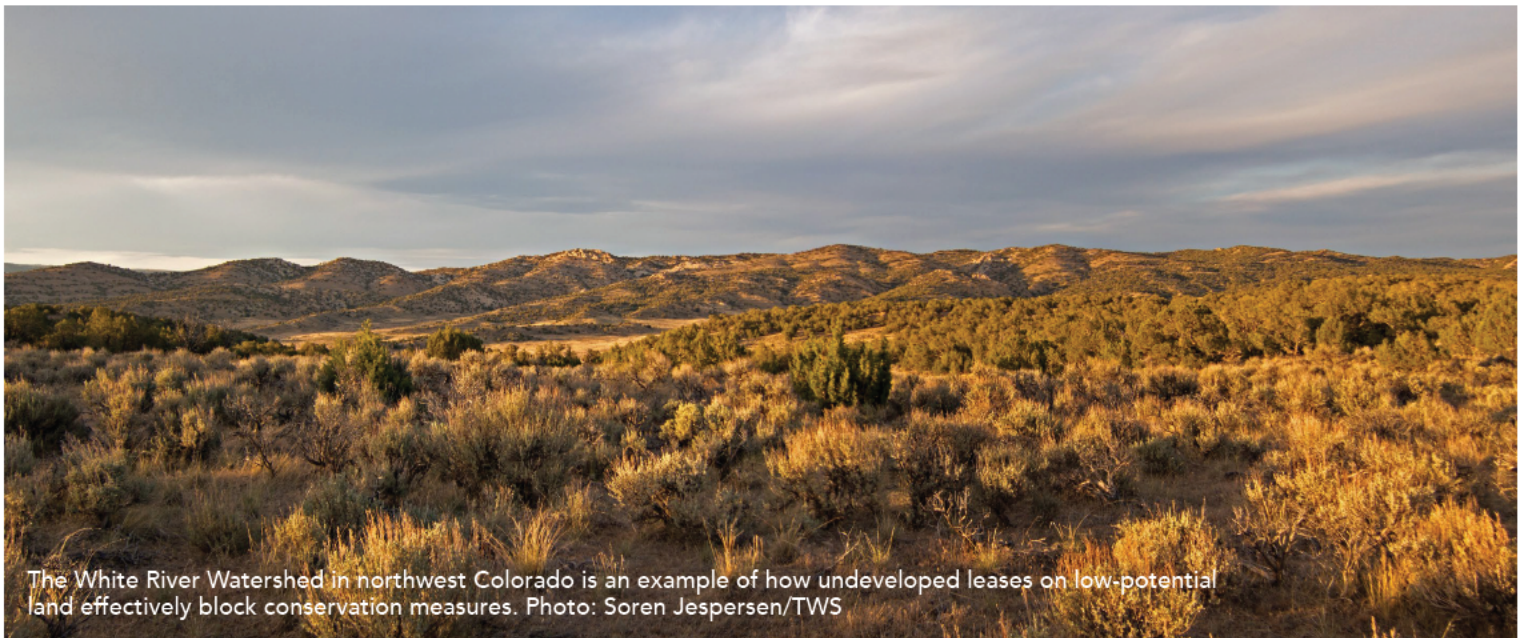
The BLM's handbook and how BLM interprets that handbook are out of step with the agency's guiding principles.

No decisions affect the future of public lands more than those made in BLM resource management plans.

In these plans, created for all public lands being considered for development, the agency sets out management guidelines. Typically, some areas are open for recreation, some are set aside for grazing and others are designated as open or closed to oil and gas leasing. Then different conditions are set forth for how those activities—particularly oil and gas leasing—are to be carried out.

BLM's Handbook on Planning for Fluid Mineral Resources (Handbook H-1624-1⁴) provides guidance to field offices on how to navigate the planning process for oil and gas resources. Under this guidance, field offices are supposed make decisions based on the likelihood of





certain resources being developed in a particular area. They take steps to identify the potential of oil and gas development and to predict where future drilling activity will take place and where impacts from this development will be focused.

This handbook directs the agency staff to formulate management prescriptions for oil and gas resources in light of where recoverable deposits of oil and gas are most likely to exist, referred to as “development potential.”⁵ The handbook, and additional guidance, also direct BLM to project “reasonably foreseeable development,” looking at both potential and “resource conflicts or controversies,” which can form the basis for refining expectations of where development is most likely and appropriate.⁶

However, the agency does not utilize that information to prepare for and address potential resource conflicts at the planning stage. The approach mandated by the mineral resources handbook *should* enable BLM to focus on the areas most likely to be targeted for development, and leave open for other uses the areas with low development potential or the potential to come into conflict with other values.

But under current BLM management policy—despite the guidance in its own handbook—the agency does not close areas with no or low development potential to leasing, regardless of the potential for resource conflict.

In fact, rather than closing areas with high conservation

value which are unlikely to be developed, the agency actually tends to set less protective conditions for leasing in areas with no or low development potential. As a result, resource conflicts are often exacerbated, where they could be avoided.

A Road to Nowhere

The BLM has lost control of leasing and development decisions on the lands it manages, leading to many other problems.

The BLM is required to hold quarterly lease sales; the lands auctioned off are usually nominated by the industry—regardless of the other uses and values of those lands. Once lands are nominated, they will almost certainly be put up for sale. Once they are sold, it is nearly impossible for the BLM to manage them for other uses. As long as most lands are open for leasing, the BLM will continue to have its management policies dictated by the fossil fuel industry.

Allowing oil and gas companies to control the leasing process leads to many other issues:

➡ **It precludes lands from being managed for multiple values.**

The BLM’s mandate to manage our public lands for multiple use and sustained yield requires consideration of a host of natural and cultural resources.⁷ BLM’s

Greater Sage-Grouse: A Conservation Case Study



Greater sage-grouse
Photo: Mason Cummings/TWS

In 2015, the BLM finalized plans for federal lands in 10 states to address conservation of the greater sage-grouse and its habitat—including the threat of oil and gas development. Yet of approximately 104 million acres of federal minerals, only about two percent—were actually closed to oil and gas leasing.

Notably, in many western land management plans written to address greater sage-grouse protection, almost all of the designated priority (high-value) habitat was completely outside of areas with high or medium oil and gas potential (96 percent in Nevada, 100 percent in California, 100 percent in the Idaho/Southwestern Montana plan, 100 percent in Oregon and over 90 percent in Utah). However, none of these plans closed any areas to oil and gas leasing; instead, they remain open to speculative leasing—a lost opportunity to make stronger decisions for conserving the greater sage-grouse.

current guidance reiterates that some lands are more valuable for other uses than for oil and gas leasing,⁸ but the agency's own policies create numerous and daunting obstacles to achieving a balance between development and other uses.

Chief amongst these is the fact that BLM often identifies the presence of development potential and undeveloped leases as precluding other designations and management actions that would otherwise benefit recreation, wilderness and wildlife.

► It impedes meaningful conservation from taking place on sensitive lands.

While leases in low-potential areas (most federal leases) are not likely to be developed, their presence serves to preclude proactive management for other important resources.

For example:

- In the **Bighorn Basin Resource Management Plan in Wyoming**, the BLM considered whether to manage 43 inventoried units, totaling over 476,000 acres, to protect their wilderness characteristics.⁹ But ultimately, none of the units are being managed to protect wilderness characteristics, because they contain oil and gas leases.¹⁰
- In the **White River Resource Management Plan Amendment in Colorado**, the BLM expressly stated that undeveloped leases on low-potential lands had effectively prevented management to protect wilderness characteristics, stating: “139,900 acres of lands with wilderness characteristics have been classified as having low, very low, or no potential....While there is no potential for fluid mineral development in most of the lands with wilderness characteristics units, the majority of the areas, totaling 101,100 acres (59 percent), are already leased for oil and gas development.”¹¹
- Similarly, in the **Colorado River Valley Resource Management Plan in Colorado**, the BLM stated it would not manage the Grand Hogback Citizens' Wilderness Proposal for the protection of wilderness characteristics based on the presence

WHY SPECULATIVE LEASING MATTERS

It's putting a majority of our public lands at risk

A staggering amount of lands with low or no oil and gas potential are open to leasing.

Our analysis of areas with low or no potential for oil and gas development shows that the vast majority of these lands are still open to leasing. And they often are leased, presumably with the hope that energy prices will rise, that new ways to extract marginal energy will be found or that the leases could be sold to another company.

The resulting speculative, non-producing leases have precluded forward-thinking, commonsense policies such as managing for wilderness-quality lands and important wildlife habitat.

Our analysis showed that:

- 95 percent of low-, very low- and no-potential lands are open to leasing in the **Bighorn Basin Resource Management Plan in Wyoming**.¹⁵
- 88 percent of low- and no-potential areas are open to leasing in the **Kremmling Resource Management Plan in Colorado**.¹⁶
- 80 percent of low-potential lands are open to leasing in the **Price Resource Management Plan in Utah**.¹⁷
- All of the low-potential sage-grouse habitat is open to leasing in Idaho. No productive oil and gas wells have ever been drilled in Idaho.

It allows a designation double standard

Its easy to get a speculative lease that prevents conservation of environmentally valuable areas, but very difficult to get a designation that would protect them.

For lands to be protected for their wilderness characteristics, an intensive land inventory process must occur. The process seeks to determine if lands meet specific criteria; then a determination of whether they can be managed as wilderness must take place.¹⁸

In the same way, protection and designation of Areas of Critical Environmental Concern (lands with identified important natural and cultural values) are mandated under BLM's governing statute.¹⁹ However, in order to maintain or designate new Areas of Critical Concern in its resource management plans, the BLM requires that an analysis demonstrate the area hold certain relevant and important characteristics that require special management.

Even then, designating the land as an Area of Critical Environmental Concern is only one of the options considered by the agency.²⁰ Consequently, while oil and gas leasing does preclude other management uses, conservation-focused management faces a higher bar. That is an unacceptable double standard.

of oil and gas leases, even though the leases had never been developed.¹²

➔ **It prevents us from effectively achieving our national climate targets.**

Implicit in the decision to leave lands open for development is the lack of consideration of the climate consequences of developing the resources found there—even though the Secretary of the Interior and the Director of the BLM have both called upon the BLM to do more to anticipate and address the contributions of public lands to climate change.

For many reasons, including climate impacts, it is unrealistic and unwise to presume 90 percent of oil and gas resources on public lands should be developed—yet that is precisely the position the BLM takes each time it refuses to close areas to oil and gas leasing.

➔ **It undermines the public's engagement in the land planning process.**

Time and again, public input and polling show that Americans strongly support managing important lands for something other than oil and gas development. But the current practice of keeping oil and gas resources open at any cost conflicts with that input. It is also, as we have shown, out of step with other federal policies directing identification and management of natural and cultural resources and features for conservation purposes.

➔ **It causes poor fiscal stewardship of taxpayer-owned resources.**

Lands are routinely obtained for well below-market value, according to research from the non-partisan Congressional Budget Office, and can be held for a nominal annual fee for the duration of the 10-year lease term.¹³ Oil and gas companies routinely extend the terms of the leases they hold indefinitely through “suspensions,” which can last decades, with no annual fees.

Under these circumstances, it is no surprise that speculation and hoarding of publicly managed oil and gas resources are commonplace. This rampant speculation contributes to the nearly two-thirds of

leased acreage not being developed. Not only is this a waste of the agency resources invested in preparing these leases for sale, it also deprives taxpayers of potential income.

When leases are not developed and not producing, they are not a good investment for the public. Non-producing leases generate less than two percent of total revenue generated by the federal onshore system; 90 percent comes from royalties paid on producing leases.¹⁴

➔ **Other resources are endangered by oil and gas leases that include insufficient protections.**

The Kremmling Field Office in Colorado provides an object lesson in the problems arising from leasing lands with low development potential without meaningful protections. For example, in each of the five lease sales including the Kremmling Field Office from 2010 to 2015, nominations have included low- or no-potential areas.²¹

Lease nominations within low-potential areas are also regularly (and often successfully) protested specifically because of the weak stipulations and lack of protection for other resources. Nominations in the Kremmling Field Office within low or no potential areas were protested based on inadequate protections for fisheries and water quality (June 2014), wildlife (August 2012) and permitted recreation activities (May 2013), and also highlighted the contradiction of BLM putting these resources at risk from speculative leasing and drilling in areas that it had already concluded had no value for oil and gas development.²²

Land within low- and no-potential areas has frequently been leased by the Kremmling Field Office, even though it is rarely drilled. In fact, most active leases issued by the office fall in low or no potential areas, and, unsurprisingly, they are not being actively developed.²³

Better decision-making during the planning process would have helped the BLM avoid administration and preparation cost for lease sales, handle subsequent protests and prevent undue risks to other important resources.

“Well, we know better now. We know that healthy, intact ecosystems are fundamental to the health of our wildlife—and our nation. They clean our air and provide our drinking water, they store carbon and combat climate change, and they are critical to our economy.

But if their integrity is undermined by a haphazard web of transmission lines, pipelines and roads, where does that leave us 50 years from now? Or 500?

It’s an issue that can’t be solved by simply creating a new national park or wildlife refuge—although there’s no doubt that we need those places to serve as critical anchors for conservation.

What we need is smart planning, on a landscape-level, irrespective of manmade lines on a map.

We need to take a holistic look at an ecosystem—on land or in the ocean—to determine where it makes sense to develop, where it makes sense to protect the natural resources, and where we can accomplish both.”

-SECRETARY OF THE INTERIOR, SALLY JEWELL



Continental Divide Trail in Colorado.
Photo: Bob Wick/BLM

Solutions for better management practices

The BLM's policies must reflect the interests of all stakeholders.

The BLM's policies are long overdue for an update that includes input from others besides just the oil and gas industry. A prime example is the agency's Handbook on Planning for Fluid Mineral Resources, which has not been overhauled since 1990.

Both in theory and in practice, the handbook undermines opportunities for protecting lands for other uses, does not provide a path for closing areas to leasing and leads to low- and no-potential areas being open to oil and gas leasing without necessary protections.

BLM's approach to leasing must be updated to reflect the agency's legal mandate, and it must take into account both development potential and conflicts with other resources and users:

➤ **More lands must be closed to oil and gas development.**

BLM plans should set out a framework for oil and gas development that would support closing lands to leases where warranted and opening lands to leasing, with appropriate protections, where development is likely. Lands that have low or no potential for leasing should not be open to leasing unless and until conditions change—an eventuality that BLM has addressed in the Dinosaur Trail Master Leasing Plan:

Leasing within the MLP would progress in phases to address resource values and concerns. Leasing would first occur in the southern portion of the MLP where the oil and gas occurrence potential is rated medium to high. Leasing within...areas of low oil and gas potential... would occur once the BLM has completed additional analysis and planning.²⁴

If the BLM closes or defers leasing in low-potential areas, and conditions change to make development in those areas more likely, the agency can then

complete additional analysis and planning to ensure that development occurs responsibly and accounts for current resource conditions. For example, BLM could commit to completing a master leasing plan in the event that there is demonstrated industry interest in leasing and developing low-potential areas.

By taking a proactive approach to managing oil and gas development as just one of the many uses of our public lands, BLM can also reduce unnecessary costs associated with speculative leasing and undeveloped lands, while making room for designating and managing lands for other uses, such as recreation, wilderness values, and fish and wildlife.

In addition, by taking control of leasing, BLM can better meet other priority goals for land use planning, such as accounting for and managing the contribution of federal lands to climate change and protecting important wildlife migration corridors.

➤ **More balanced management is needed.**

A more thoughtful, realistic approach would be consistent with BLM's mandate to manage the public lands for multiple use and sustained yield.

The agency's governing statute identifies a wide range of uses and values and provides for using lands "for some or all of these resources" and "with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output."²⁵

The courts have ruled that "[i]t is past doubt that the principle of multiple use does not require BLM to prioritize development over other uses."²⁶ Even the BLM itself has made it clear that this is a practice that is out of step with its own directives:

The BLM recognizes that, in some cases, leasing of oil and gas resources may not be consistent with protection of other important resources and values, including units of the National Park System; national wildlife refuges; other specially designated areas; wildlife; and cultural, historic, and paleontological values. **Under applicable laws and policies, there is no presumed preference for oil and gas development over other uses.**²⁷



Photo: Simon Fraser University - flickr

Other aspects of BLM's legal obligations also support limiting or eliminating leasing in low- and no-potential areas, including for purposes of protecting other important resources. For example, BLM is subject to numerous requirements to "minimize" the environmental and other impacts of oil and gas leasing and development.²⁸

Faithfully applying a current understanding of laws and policies would lead to closing more lands to oil and gas leasing, consistent with the agency's multiple use obligations.

 **A smarter approach would have minimal impacts on oil and gas production.**

Modernizing the handbook with an approach that provides for closing lands to leasing and limits leasing in low- or no-potential areas would not only support BLM's obligation to consider managing lands for fish and wildlife, recreation and wilderness values, but also have minimal impacts on industry objectives.

In locations like the Ely District in Nevada, where federal minerals are almost 90 percent open to leasing, only 32 wells were authorized over the past 101 years (as of May 21, 2014), even though there are 936 active leases covering just over two million acres of public land.²⁹

Closing these lands to speculative leasing will not harm responsible oil and gas development. If conditions change so that development in those areas is more likely, BLM can then complete additional analysis and planning to manage additional development. For example, BLM could commit to completing a master leasing plan in the event that there is demonstrated industry interest in leasing and developing low potential areas.

 **The BLM's own master leasing plans provide a working model for improved management.**

The BLM has already taken a more proactive and prescriptive approach to managing oil and gas leasing and development through master leasing plans. Incorporate practices such as closing lands to leasing to minimize resource conflicts and requiring phasing of leasing and development to reflect priorities while also limiting damage to other resources.³⁰ As the handbook

states, "The MLP establishes a guiding framework for the development of the area and provides a vision for how future development will proceed."³¹

These tools and concepts could be scaled up to inform agency decision-making at the land-use planning level.

Recommendations

These policy recommendations provide an exit from the "energy trumps all" path the BLM is currently pursuing.

We recommend these specific steps be taken:

1. INTERIM GUIDANCE SHOULD BE ISSUED IMMEDIATELY.

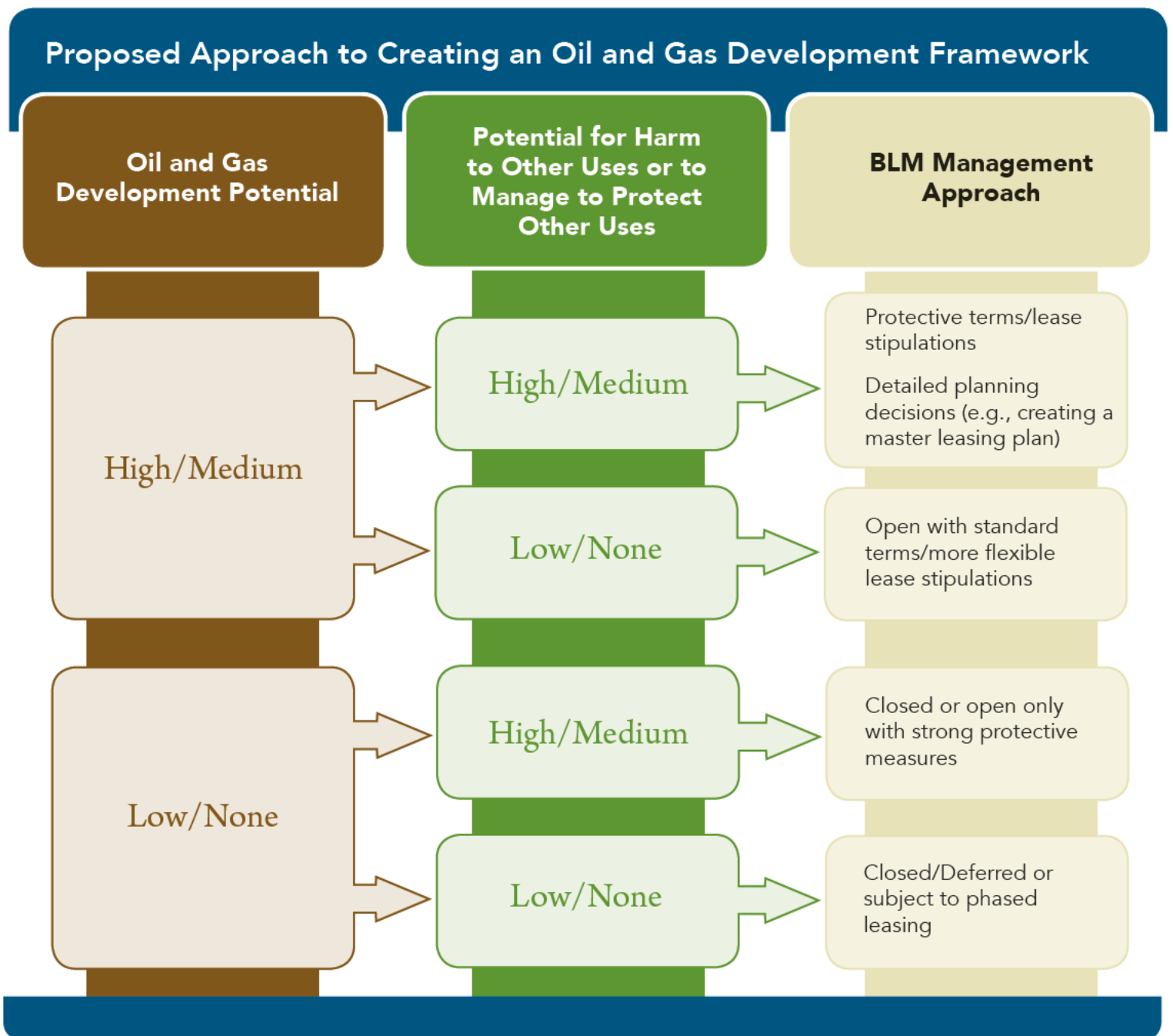
To clarify the manner in which Handbook 1624-1 should be applied in preparing resource management plans, guidance should be issued that:

- a. There is no presumption that lands should be available for oil and gas leasing; rather, determinations should be based on resource potential, likely conflicts and potential harm to other resources or uses.
- b. The BLM should collect and update information on development potential, likely impacts of development on other resources and uses, and possible designations or management priorities that would conflict with leasing. Based on this information, the BLM should construct a development framework taking into account support for a variety of resources and uses.
- c. Lands that have high or medium development potential should be considered for designation as available for leasing, but with appropriate protections where other uses or resources are present—and with the understanding that some lands with high or medium potential may still be better suited to management for other uses.
- d. Lands that have low or no development potential should be considered for closure or deferral pursuant to phased leasing, with the understanding that where there is a significant potential for other uses to be supported by closure or harmed by development, these lands should be closed.

2. THE HANDBOOK ON PLANNING FOR FLUID MINERAL RESOURCES SHOULD BE UPDATED TO CLARIFY AND INCORPORATE THESE KEY CONCEPTS AS SOON AS POSSIBLE.

3. INTERIM GUIDANCE ON EVALUATING LEASE SALE NOMINATIONS SHOULD BE ISSUED TO ADDRESS THE CURRENT IMBALANCE AND SIGNIFICANT PROBLEMS THE HANDBOOK HAS ALREADY GENERATED. When assessing lease proposals under existing resource management plans where more than 75 percent of minerals are open for leasing, BLM should take a hard look at whether decisions on availability for leasing would have been made differently based on current guidance.

An updated approach to planning for oil and gas leasing should meaningfully account for development potential and conflicts with other resources, as depicted in the below table.



- 1 A more in-depth study accompanies this report. <https://wilderness.org/resource/no-exit-fixing-blm%E2%80%99s-indiscriminate-energy-leasing-whitepaper>
- 2 http://www.blm.gov/style/medialib/blm/wo/MINERALS_REALTY_AND_RESOURCE_PROTECTION_/energy/oil_gas_statistics/data_sets.Par.69959.File.dat/summary.pdf
- 3 https://www.cbo.gov/sites/default/files/114th-congress-2015-2016/reports/51421-oil_and_gas_options.pdf, p. 19.
- 4 http://www.blm.gov/style/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.44374.File.dat/H_1624_1.pdf
- 5 There are eight steps set out in the handbook, which focus first on identifying existing conditions and potential, as well as the impacts that would arise from oil and gas development if existing management remains in place. In the process of formulating alternatives to the existing management, the handbook directs the BLM to focus on how to maximize keeping lands open to leasing, stating that alternatives should be “exploring opportunities for enhancing or expanding resources or resource uses” and will “identify any subsurface management constraints or mitigating measures that are required to take advantage of opportunities and to resolve any problems.” A detailed overview of the decision process set out in the Handbook accompanies this report. <https://wilderness.org/sites/default/files/Planning%20for%20Leasing%20Overview.pdf>. See H-1624-1, pp. III-10 - III-11.
- 6 See H-1624-1, pp. III-7 - III-8, Instruction Memorandum 2004-089.
- 7 See 43 U.S.C. §§ 1701(a)(7)-(8), 1702(c), 1702(h).
- 8 See Instruction Memorandum 2010-117, p. 2. (“The BLM recognizes that, in some cases, leasing of oil and gas resources may not be consistent with protection of other important resources and values, including units of the National Park System; national wildlife refuges; other specially designated areas; wildlife; and cultural, historic, and paleontological values. Under applicable laws and policies, there is no presumed preference for oil and gas development over other uses.”)
- 9 Bighorn Basin Proposed RMP, p. 3-191.
- 10 See Bighorn Basin Proposed RMP, Appendix S at Table S-1. (“Rationale for Not Managing Lands with Wilderness Characteristics for Naturalness, Outstanding Opportunities for Solitude, and Primitive and Unconfined Recreation, by Field Office and Unit.”) See, e.g., regarding Unit 508 AK: “It is recommended not to manage for wilderness characteristics because of the existing leases for oil and gas.”
- 11 See White River Proposed RMP, pp. 4-289-4-290.
- 12 See Colorado River Valley Proposed RMP, p. 3-135.
- 13 The Congressional Budget Office found that fully one-quarter of leases are issued for the minimum bid of \$2 per acre—meaning the cost of holding public lands is de minimus. See https://www.cbo.gov/sites/default/files/114th-congress-2015-2016/reports/51421-oil_and_gas_options.pdf, p. 18.
- 14 https://www.cbo.gov/sites/default/files/114th-congress-2015-2016/reports/51421-oil_and_gas_options.pdf, p. 2.
- 15 Bighorn Basin Proposed RMP, p. 4-89.
- 16 Kremmling Proposed RMP, p. 2-28.
- 17 Price Proposed RMP, p. 304.
- 18 See BLM Manuals 6310 (Conducting Wilderness Characteristics Inventory of BLM Lands) and 6320 (Considering Lands with Wilderness Characteristics in the BLM Land Use Planning Process).
- 19 43 U.S.C. § 1712(c)(3).
- 20 See BLM Manual 1613 (Areas of Critical Environmental Concern).
- 21 See EA for the KFO June 2014 Competitive Oil & Gas Lease Sale (November 2013) at p. 10 (“According to the Reasonable Foreseeable Development report (RFD), there is low potential for oil and gas development in the location of the Jackson County parcels (BLM, 2008).”; May 2013 Competitive Oil & Gas Lease Sale PDF Maps at p. 2 (showing nominated lease parcels in T. 11 N, R. 76 W, an area with no potential for oil or gas under the 1991 RFD); August 2011 Competitive Oil & Gas Lease Sale Map (showing the location of COC74901 within T. 2 N, 79 W, an area with low or no oil and gas potential under the 1991 RFD); August 2010 Competitive Oil & Gas Lease Sale Map (showing the location of COC74518 within T. 11 N, R. 81 W and within an areas of low or no oil or gas potential under the 1991 RFD); May 2010 Competitive Oil & Gas Lease Sale Map (showing the location of COC74397 within T. 10 N, R. 82 W, an area with low or no oil or gas potential under the 1991 RFD).
- 22 Leases within areas with low or no potential have been protested in at least each of the past three lease sales in the KFO. See CO BLM Lease Sale Archive June 2014, May 2013 and August 2011 lease sale protests.
- 23 See 2008 RFD Report, p. 6 (stating that 210,852 acres of federal mineral estate are currently under lease) and Draft Kremmling RMP Appendix V, p. V-3 (indicating that at least 115,200 acres of low and no potential areas—more than half of the total leased—are under lease in the KFO); see Rocky Mountain Wild, “Oil and Gas Leasing and Development in Colorado as of March 2015.”
- 24 White River Proposed RMP, Table 2-17a-2.
- 25 43 U.S.C. § 1702(c).
- 26 New Mexico Ex. Rel. Richardson v. BLM, 565 F.3d 683, 710 (10th Cir. 2009).
- 27 Instruction Memorandum 2010-117, p. 2.
- 28 See 43 C.F.R. § 3101.1-2 (reasonable measures may be required to minimize adverse impacts on leases); 43 C.F.R. § 2920.7(b)(2) (land use authorizations shall minimize damage to specified environmental resources); BLM Standard Lease Form 3100-11 (lessees “must” conduct their operations so as to minimize adverse impacts); Onshore Order No. 1 §§ IV and III(F)(a)(3) (operators “must” minimize adverse impacts and BLM may require reasonable measures to minimize adverse impacts when APDs are approved); BLM Gold Book (several provisions referencing minimization including a provision to “minimize undesirable impacts to the environment”).
- 29 See BLM Nevada Preliminary EA for the Dec. 2015 Oil and Gas Lease Sale, p. 1.4.
- 30 H-1624-1, Chapter V, pp. V-1-V-7.
- 31 *Ibid.*, p. V-2.

Our mission is to protect wilderness and inspire Americans to care for our wild places.



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From: Nada Culver
To: "rwelch@blm.gov"; [Lonny Bagley](#); [Hall, Steven](#)
Subject: New TWS report - No Exit - being released tomorrow
Date: Monday, June 27, 2016 3:50:57 PM
Attachments: [TWS No Exit Report-FinalDraft-6-23-16.pdf](#)

Hi Ruth, Lonny and Steven– As I mentioned previously (and discussed with Lonny recently), I wanted to let you know that The Wilderness Society is releasing a report tomorrow that proposes improvements to the BLM’s approach to planning for oil and gas leasing and development. We’ve often highlighted how the vast majority of public lands and minerals are available to leasing. This report includes some more research into how the agency’s guidance leads to that result, as well as the effects that has on planning and conservation, then provides recommendations as well.

This is our close to final draft and I will send a link to the final version and supporting materials tomorrow but wanted to make sure you saw it ahead of time.

Nada Culver

Senior Counsel and Director, BLM Action Center

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FIXING THE BLM'S Indiscriminate Energy Leasing

Decades of adherence to the belief that all lands should be available for oil and gas leasing has kept our public lands from being protected and put them at unnecessary risk for destruction. It's time to update the BLM's approach and give the public more of a say in managing our public lands.

Introduction

This report describes how the U.S. government agency that oversees 700 million subsurface acres of oil and gas resources on nearly 250 million acres of public lands is saddled with outdated and unbalanced policies, often contradicting its own mandate to manage the land for multiple uses.

Ninety percent of the public lands managed by the Bureau of Land Management are open to oil and gas leasing and mineral resources even in areas with little or no potential for developing these resources, compromising potential for protecting wildlife and recreation, while encouraging speculative leasing.

The report provides a series of recommendations that would, if adopted by the BLM, lead to more

balanced decision-making. It lays out specific ways for the agency to better weigh the benefits of leasing a particular area with the potential harm. Such an approach would drive better decisions for the American people, the owners of U.S. public lands.

The Problem

The BLM is not fulfilling its duty to manage public lands for multiple uses.

The Bureau of Land Management rarely closes lands to oil and gas leasing in its resource management plans, despite the risk leasing poses to wildlife, cultural and other valuable resources. But this approach is in conflict with the agency's guiding management principle, the multiple use mandate.



Oil and gas development threaten many of our public lands, like the Pawnee National Grassland in Colorado.
Photo: Mason Cummings/TWS

Common sense would dictate that the BLM close areas with other important values than oil and gas potential, particularly areas unlikely to be developed. But the BLM's internal guidance, and the way that the agency interprets that guidance, has made it extremely difficult to actually close lands to leasing. Instead, the BLM continues to create opportunities for energy speculation at a high cost to recreation, wilderness and wildlife.

An examination of current BLM policies and management practices shows that there is little effort to protect at least some public lands from oil and gas leasing.¹

As a result, the vast majority of U.S. public lands (90 percent) are available for leasing—regardless of whether those lands have other important values that should be protected and regardless of whether the BLM's own data show there is low—or even no—potential for oil and gas. This fundamental flaw in the BLM's guidance has led to a current total of 32 million acres leased for oil and gas development, with less than 13 million under development.²

When public lands with low energy development potential are leased to oil and gas companies,

taxpayers lose out on revenue, as well as other important uses of these lands like recreation and wildlife management. In fact, a Congressional Budget Office report recently concluded that, for parcels leased between 1996 and 2003 (all of which have reached the end of their 10-year exploration period), only about 10 percent of onshore leases issued competitively and three percent of those issued noncompetitively actually entered production.³

The BLM needs to update its approach—it's time to bring 25-year-old policies into this century. In the short term this means issuing immediate guidance for protecting sensitive lands and lands with low energy development potential, and in the long term, commencing a formal revision to BLM's planning guidance.

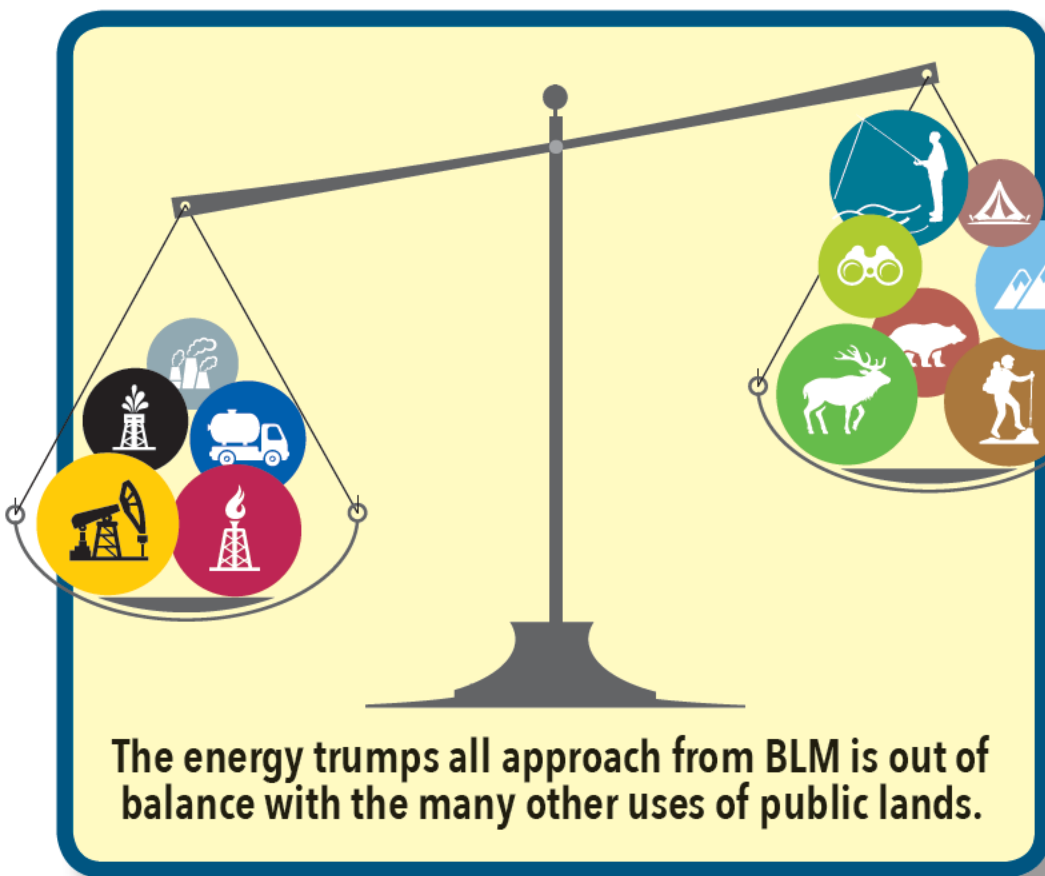
Misguided Guidance

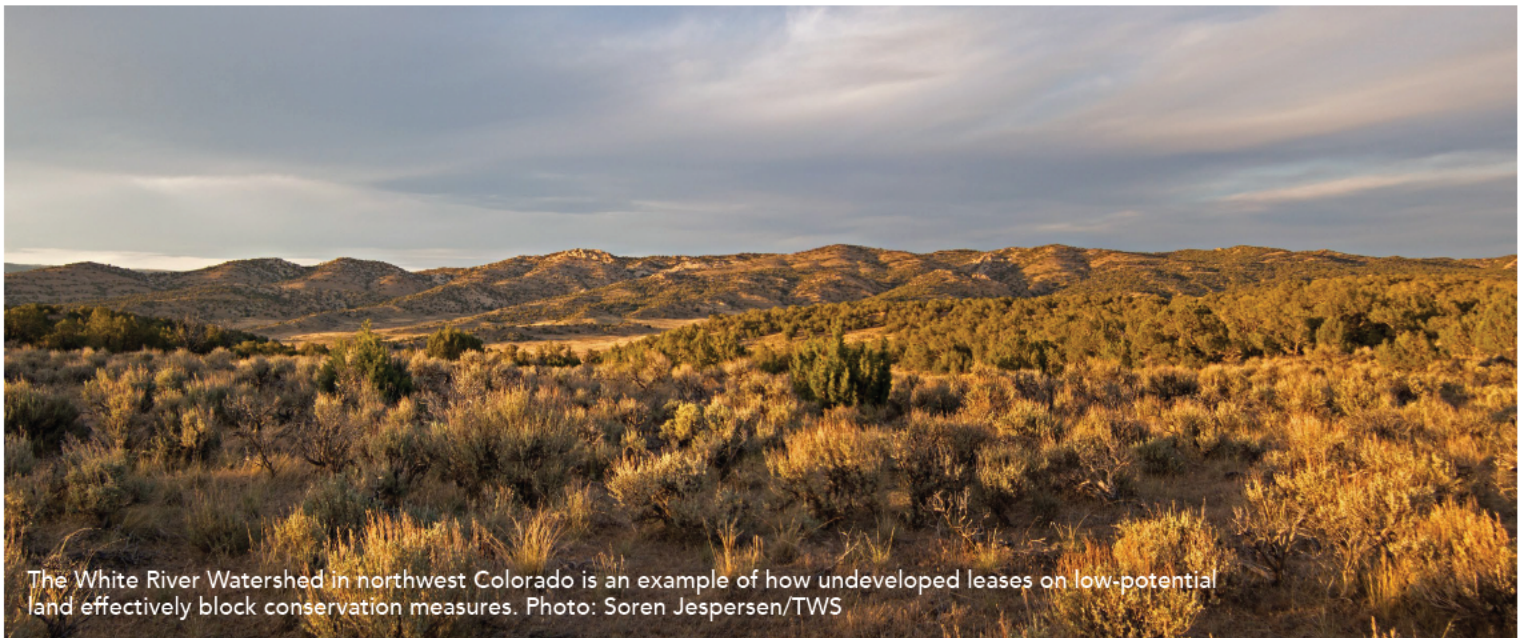
The BLM's handbook and how BLM interprets that handbook are out of step with the agency's guiding principles.

No decisions affect the future of public lands more than those made in BLM resource management plans.

In these plans, created for all public lands being considered for development, the agency sets out management guidelines. Typically, some areas are open for recreation, some are set aside for grazing and others are designated as open or closed to oil and gas leasing. Then different conditions are set forth for how those activities—particularly oil and gas leasing—are to be carried out.

BLM's Handbook on Planning for Fluid Mineral Resources (Handbook H-1624-1⁴) provides guidance to field offices on how to navigate the planning process for oil and gas resources. Under this guidance, field offices are supposed make decisions based on the likelihood of





The White River Watershed in northwest Colorado is an example of how undeveloped leases on low-potential land effectively block conservation measures. Photo: Soren Jespersen/TWS

certain resources being developed in a particular area. They take steps to identify the potential of oil and gas development and to predict where future drilling activity will take place and where impacts from this development will be focused.

This handbook directs the agency staff to formulate management prescriptions for oil and gas resources in light of where recoverable deposits of oil and gas are most likely to exist, referred to as “development potential.”⁵ The handbook, and additional guidance, also direct BLM to project “reasonably foreseeable development,” looking at both potential and “resource conflicts or controversies,” which can form the basis for refining expectations of where development is most likely and appropriate.⁶

However, the agency does not utilize that information to prepare for and address potential resource conflicts at the planning stage. The approach mandated by the mineral resources handbook *should* enable BLM to focus on the areas most likely to be targeted for development, and leave open for other uses the areas with low development potential or the potential to come into conflict with other values.

But under current BLM management policy—despite the guidance in its own handbook—the agency does not close areas with no or low development potential to leasing, regardless of the potential for resource conflict.

In fact, rather than closing areas with high conservation

value which are unlikely to be developed, the agency actually tends to set less protective conditions for leasing in areas with no or low development potential. As a result, resource conflicts are often exacerbated, where they could be avoided.

A Road to Nowhere

The BLM has lost control of leasing and development decisions on the lands it manages, leading to many other problems.

The BLM is required to hold quarterly lease sales; the lands auctioned off are usually nominated by the industry—regardless of the other uses and values of those lands. Once lands are nominated, they will almost certainly be put up for sale. Once they are sold, it is nearly impossible for the BLM to manage them for other uses. As long as most lands are open for leasing, the BLM will continue to have its management policies dictated by the fossil fuel industry.

Allowing oil and gas companies to control the leasing process leads to many other issues:

➡ **It precludes lands from being managed for multiple values.**

The BLM’s mandate to manage our public lands for multiple use and sustained yield requires consideration of a host of natural and cultural resources.⁷ BLM’s

Greater Sage-Grouse: A Conservation Case Study



Greater sage-grouse
Photo: Mason Cummings/TWS

In 2015, the BLM finalized plans for federal lands in 10 states to address conservation of the greater sage-grouse and its habitat—including the threat of oil and gas development. Yet of approximately 104 million acres of federal minerals, only about two percent—were actually closed to oil and gas leasing.

Notably, in many western land management plans written to address greater sage-grouse protection, almost all of the designated priority (high-value) habitat was completely outside of areas with high or medium oil and gas potential (96 percent in Nevada, 100 percent in California, 100 percent in the Idaho/Southwestern Montana plan, 100 percent in Oregon and over 90 percent in Utah). However, none of these plans closed any areas to oil and gas leasing; instead, they remain open to speculative leasing—a lost opportunity to make stronger decisions for conserving the greater sage-grouse.

current guidance reiterates that some lands are more valuable for other uses than for oil and gas leasing,⁸ but the agency's own policies create numerous and daunting obstacles to achieving a balance between development and other uses.

Chief amongst these is the fact that BLM often identifies the presence of development potential and undeveloped leases as precluding other designations and management actions that would otherwise benefit recreation, wilderness and wildlife.

► It impedes meaningful conservation from taking place on sensitive lands.

While leases in low-potential areas (most federal leases) are not likely to be developed, their presence serves to preclude proactive management for other important resources.

For example:

- In the **Bighorn Basin Resource Management Plan in Wyoming**, the BLM considered whether to manage 43 inventoried units, totaling over 476,000 acres, to protect their wilderness characteristics.⁹ But ultimately, none of the units are being managed to protect wilderness characteristics, because they contain oil and gas leases.¹⁰
- In the **White River Resource Management Plan Amendment in Colorado**, the BLM expressly stated that undeveloped leases on low-potential lands had effectively prevented management to protect wilderness characteristics, stating: “139,900 acres of lands with wilderness characteristics have been classified as having low, very low, or no potential....While there is no potential for fluid mineral development in most of the lands with wilderness characteristics units, the majority of the areas, totaling 101,100 acres (59 percent), are already leased for oil and gas development.”¹¹
- Similarly, in the **Colorado River Valley Resource Management Plan in Colorado**, the BLM stated it would not manage the Grand Hogback Citizens' Wilderness Proposal for the protection of wilderness characteristics based on the presence

WHY SPECULATIVE LEASING MATTERS

It's putting a majority of our public lands at risk

A staggering amount of lands with low or no oil and gas potential are open to leasing.

Our analysis of areas with low or no potential for oil and gas development shows that the vast majority of these lands are still open to leasing. And they often are leased, presumably with the hope that energy prices will rise, that new ways to extract marginal energy will be found or that the leases could be sold to another company.

The resulting speculative, non-producing leases have precluded forward-thinking, commonsense policies such as managing for wilderness-quality lands and important wildlife habitat.

Our analysis showed that:

- 95 percent of low-, very low- and no-potential lands are open to leasing in the **Bighorn Basin Resource Management Plan in Wyoming**.¹⁵
- 88 percent of low- and no-potential areas are open to leasing in the **Kremmling Resource Management Plan in Colorado**.¹⁶
- 80 percent of low-potential lands are open to leasing in the **Price Resource Management Plan in Utah**.¹⁷
- All of the low-potential sage-grouse habitat is open to leasing in Idaho. No productive oil and gas wells have ever been drilled in Idaho.

It allows a designation double standard

Its easy to get a speculative lease that prevents conservation of environmentally valuable areas, but very difficult to get a designation that would protect them.

For lands to be protected for their wilderness characteristics, an intensive land inventory process must occur. The process seeks to determine if lands meet specific criteria; then a determination of whether they can be managed as wilderness must take place.¹⁸

In the same way, protection and designation of Areas of Critical Environmental Concern (lands with identified important natural and cultural values) are mandated under BLM's governing statute.¹⁹ However, in order to maintain or designate new Areas of Critical Concern in its resource management plans, the BLM requires that an analysis demonstrate the area hold certain relevant and important characteristics that require special management.

Even then, designating the land as an Area of Critical Environmental Concern is only one of the options considered by the agency.²⁰ Consequently, while oil and gas leasing does preclude other management uses, conservation-focused management faces a higher bar. That is an unacceptable double standard.

of oil and gas leases, even though the leases had never been developed.¹²

➔ **It prevents us from effectively achieving our national climate targets.**

Implicit in the decision to leave lands open for development is the lack of consideration of the climate consequences of developing the resources found there—even though the Secretary of the Interior and the Director of the BLM have both called upon the BLM to do more to anticipate and address the contributions of public lands to climate change.

For many reasons, including climate impacts, it is unrealistic and unwise to presume 90 percent of oil and gas resources on public lands should be developed—yet that is precisely the position the BLM takes each time it refuses to close areas to oil and gas leasing.

➔ **It undermines the public’s engagement in the land planning process.**

Time and again, public input and polling show that Americans strongly support managing important lands for something other than oil and gas development. But the current practice of keeping oil and gas resources open at any cost conflicts with that input. It is also, as we have shown, out of step with other federal policies directing identification and management of natural and cultural resources and features for conservation purposes.

➔ **It causes poor fiscal stewardship of taxpayer-owned resources.**

Lands are routinely obtained for well below-market value, according to research from the non-partisan Congressional Budget Office, and can be held for a nominal annual fee for the duration of the 10-year lease term.¹³ Oil and gas companies routinely extend the terms of the leases they hold indefinitely through “suspensions,” which can last decades, with no annual fees.

Under these circumstances, it is no surprise that speculation and hoarding of publicly managed oil and gas resources are commonplace. This rampant speculation contributes to the nearly two-thirds of

leased acreage not being developed. Not only is this a waste of the agency resources invested in preparing these leases for sale, it also deprives taxpayers of potential income.

When leases are not developed and not producing, they are not a good investment for the public. Non-producing leases generate less than two percent of total revenue generated by the federal onshore system; 90 percent comes from royalties paid on producing leases.¹⁴

➔ **Other resources are endangered by oil and gas leases that include insufficient protections.**

The Kremmling Field Office in Colorado provides an object lesson in the problems arising from leasing lands with low development potential without meaningful protections. For example, in each of the five lease sales including the Kremmling Field Office from 2010 to 2015, nominations have included low- or no-potential areas.²¹

Lease nominations within low-potential areas are also regularly (and often successfully) protested specifically because of the weak stipulations and lack of protection for other resources. Nominations in the Kremmling Field Office within low or no potential areas were protested based on inadequate protections for fisheries and water quality (June 2014), wildlife (August 2012) and permitted recreation activities (May 2013), and also highlighted the contradiction of BLM putting these resources at risk from speculative leasing and drilling in areas that it had already concluded had no value for oil and gas development.²²

Land within low- and no-potential areas has frequently been leased by the Kremmling Field Office, even though it is rarely drilled. In fact, most active leases issued by the office fall in low or no potential areas, and, unsurprisingly, they are not being actively developed.²³

Better decision-making during the planning process would have helped the BLM avoid administration and preparation cost for lease sales, handle subsequent protests and prevent undue risks to other important resources.

“Well, we know better now. We know that healthy, intact ecosystems are fundamental to the health of our wildlife—and our nation. They clean our air and provide our drinking water, they store carbon and combat climate change, and they are critical to our economy.

But if their integrity is undermined by a haphazard web of transmission lines, pipelines and roads, where does that leave us 50 years from now? Or 500?

It’s an issue that can’t be solved by simply creating a new national park or wildlife refuge—although there’s no doubt that we need those places to serve as critical anchors for conservation.

What we need is smart planning, on a landscape-level, irrespective of manmade lines on a map.

We need to take a holistic look at an ecosystem—on land or in the ocean—to determine where it makes sense to develop, where it makes sense to protect the natural resources, and where we can accomplish both.”

-SECRETARY OF THE INTERIOR, SALLY JEWELL



Continental Divide Trail in Colorado.
Photo: Bob Wick/BLM

Solutions for better management practices

The BLM's policies must reflect the interests of all stakeholders.

The BLM's policies are long overdue for an update that includes input from others besides just the oil and gas industry. A prime example is the agency's Handbook on Planning for Fluid Mineral Resources, which has not been overhauled since 1990.

Both in theory and in practice, the handbook undermines opportunities for protecting lands for other uses, does not provide a path for closing areas to leasing and leads to low- and no-potential areas being open to oil and gas leasing without necessary protections.

BLM's approach to leasing must be updated to reflect the agency's legal mandate, and it must take into account both development potential and conflicts with other resources and users:

➤ **More lands must be closed to oil and gas development.**

BLM plans should set out a framework for oil and gas development that would support closing lands to leases where warranted and opening lands to leasing, with appropriate protections, where development is likely. Lands that have low or no potential for leasing should not be open to leasing unless and until conditions change—an eventuality that BLM has addressed in the Dinosaur Trail Master Leasing Plan:

Leasing within the MLP would progress in phases to address resource values and concerns. Leasing would first occur in the southern portion of the MLP where the oil and gas occurrence potential is rated medium to high. Leasing within...areas of low oil and gas potential... would occur once the BLM has completed additional analysis and planning.²⁴

If the BLM closes or defers leasing in low-potential areas, and conditions change to make development in those areas more likely, the agency can then

complete additional analysis and planning to ensure that development occurs responsibly and accounts for current resource conditions. For example, BLM could commit to completing a master leasing plan in the event that there is demonstrated industry interest in leasing and developing low-potential areas.

By taking a proactive approach to managing oil and gas development as just one of the many uses of our public lands, BLM can also reduce unnecessary costs associated with speculative leasing and undeveloped lands, while making room for designating and managing lands for other uses, such as recreation, wilderness values, and fish and wildlife.

In addition, by taking control of leasing, BLM can better meet other priority goals for land use planning, such as accounting for and managing the contribution of federal lands to climate change and protecting important wildlife migration corridors.

➤ **More balanced management is needed.**

A more thoughtful, realistic approach would be consistent with BLM's mandate to manage the public lands for multiple use and sustained yield.

The agency's governing statute identifies a wide range of uses and values and provides for using lands "for some or all of these resources" and "with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output."²⁵

The courts have ruled that "[i]t is past doubt that the principle of multiple use does not require BLM to prioritize development over other uses."²⁶ Even the BLM itself has made it clear that this is a practice that is out of step with its own directives:

The BLM recognizes that, in some cases, leasing of oil and gas resources may not be consistent with protection of other important resources and values, including units of the National Park System; national wildlife refuges; other specially designated areas; wildlife; and cultural, historic, and paleontological values. **Under applicable laws and policies, there is no presumed preference for oil and gas development over other uses.**²⁷



Photo: Simon Fraser University - flickr

Other aspects of BLM's legal obligations also support limiting or eliminating leasing in low- and no-potential areas, including for purposes of protecting other important resources. For example, BLM is subject to numerous requirements to "minimize" the environmental and other impacts of oil and gas leasing and development.²⁸

Faithfully applying a current understanding of laws and policies would lead to closing more lands to oil and gas leasing, consistent with the agency's multiple use obligations.

 **A smarter approach would have minimal impacts on oil and gas production.**

Modernizing the handbook with an approach that provides for closing lands to leasing and limits leasing in low- or no-potential areas would not only support BLM's obligation to consider managing lands for fish and wildlife, recreation and wilderness values, but also have minimal impacts on industry objectives.

In locations like the Ely District in Nevada, where federal minerals are almost 90 percent open to leasing, only 32 wells were authorized over the past 101 years (as of May 21, 2014), even though there are 936 active leases covering just over two million acres of public land.²⁹

Closing these lands to speculative leasing will not harm responsible oil and gas development. If conditions change so that development in those areas is more likely, BLM can then complete additional analysis and planning to manage additional development. For example, BLM could commit to completing a master leasing plan in the event that there is demonstrated industry interest in leasing and developing low potential areas.

 **The BLM's own master leasing plans provide a working model for improved management.**

The BLM has already taken a more proactive and prescriptive approach to managing oil and gas leasing and development through master leasing plans. Incorporate practices such as closing lands to leasing to minimize resource conflicts and requiring phasing of leasing and development to reflect priorities while also limiting damage to other resources.³⁰ As the handbook

states, "The MLP establishes a guiding framework for the development of the area and provides a vision for how future development will proceed."³¹

These tools and concepts could be scaled up to inform agency decision-making at the land-use planning level.

Recommendations

These policy recommendations provide an exit from the "energy trumps all" path the BLM is currently pursuing.

We recommend these specific steps be taken:

1. INTERIM GUIDANCE SHOULD BE ISSUED IMMEDIATELY.

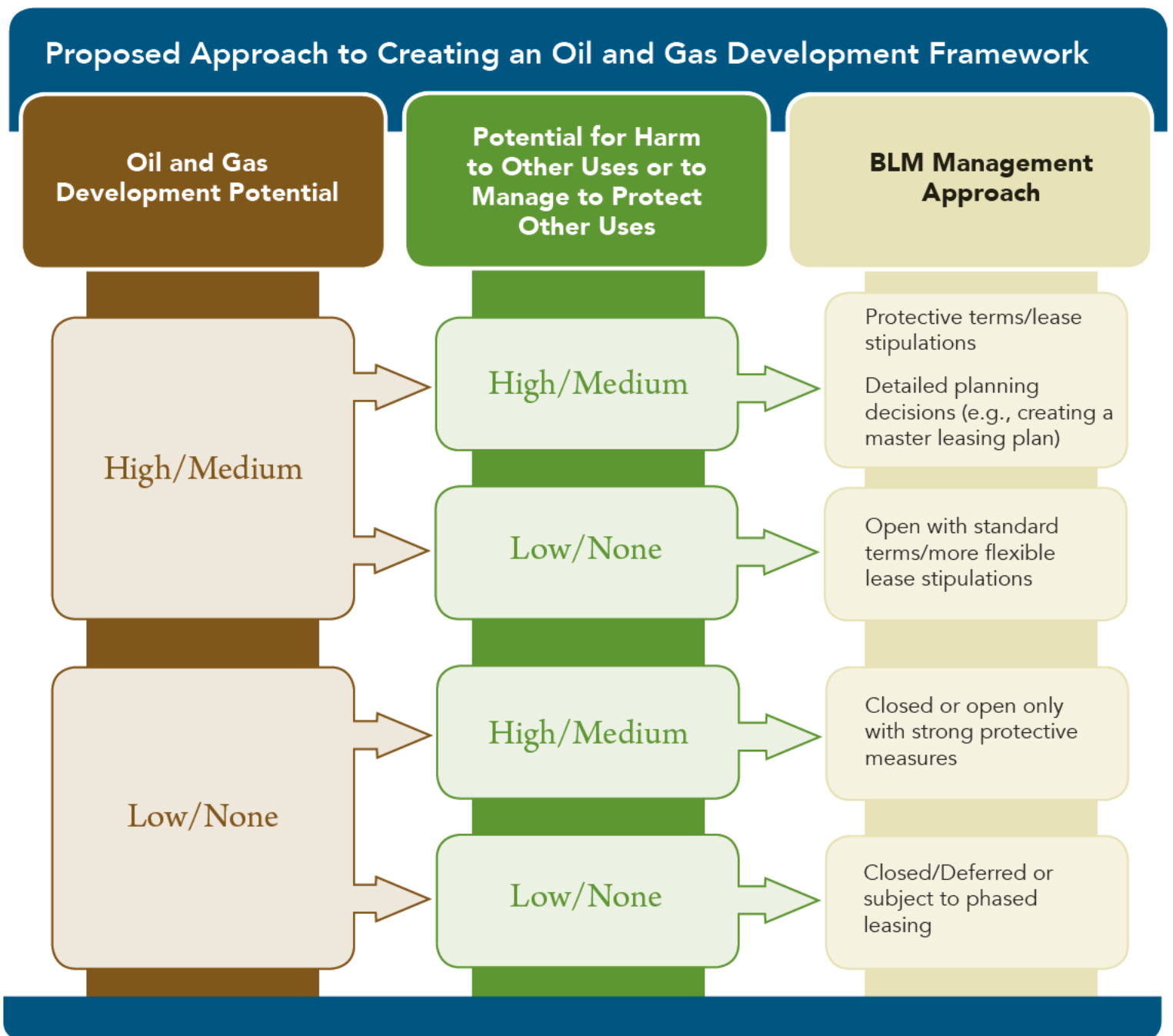
To clarify the manner in which Handbook 1624-1 should be applied in preparing resource management plans, guidance should be issued that:

- a. There is no presumption that lands should be available for oil and gas leasing; rather, determinations should be based on resource potential, likely conflicts and potential harm to other resources or uses.
- b. The BLM should collect and update information on development potential, likely impacts of development on other resources and uses, and possible designations or management priorities that would conflict with leasing. Based on this information, the BLM should construct a development framework taking into account support for a variety of resources and uses.
- c. Lands that have high or medium development potential should be considered for designation as available for leasing, but with appropriate protections where other uses or resources are present—and with the understanding that some lands with high or medium potential may still be better suited to management for other uses.
- d. Lands that have low or no development potential should be considered for closure or deferral pursuant to phased leasing, with the understanding that where there is a significant potential for other uses to be supported by closure or harmed by development, these lands should be closed.

2. THE HANDBOOK ON PLANNING FOR FLUID MINERAL RESOURCES SHOULD BE UPDATED TO CLARIFY AND INCORPORATE THESE KEY CONCEPTS AS SOON AS POSSIBLE.

3. INTERIM GUIDANCE ON EVALUATING LEASE SALE NOMINATIONS SHOULD BE ISSUED TO ADDRESS THE CURRENT IMBALANCE AND SIGNIFICANT PROBLEMS THE HANDBOOK HAS ALREADY GENERATED. When assessing lease proposals under existing resource management plans where more than 75 percent of minerals are open for leasing, BLM should take a hard look at whether decisions on availability for leasing would have been made differently based on current guidance.

An updated approach to planning for oil and gas leasing should meaningfully account for development potential and conflicts with other resources, as depicted in the below table.



- 1 A more in-depth study accompanies this report. <https://wilderness.org/resource/no-exit-fixing-blm%E2%80%99s-indiscriminate-energy-leasing-whitepaper>
- 2 http://www.blm.gov/style/medialib/blm/wo/MINERALS_REALTY_AND_RESOURCE_PROTECTION_/energy/oil_gas_statistics/data_sets.Par.69959.File.dat/summary.pdf
- 3 https://www.cbo.gov/sites/default/files/114th-congress-2015-2016/reports/51421-oil_and_gas_options.pdf, p. 19.
- 4 http://www.blm.gov/style/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.44374.File.dat/H_1624_1.pdf
- 5 There are eight steps set out in the handbook, which focus first on identifying existing conditions and potential, as well as the impacts that would arise from oil and gas development if existing management remains in place. In the process of formulating alternatives to the existing management, the handbook directs the BLM to focus on how to maximize keeping lands open to leasing, stating that alternatives should be “exploring opportunities for enhancing or expanding resources or resource uses” and will “identify any subsurface management constraints or mitigating measures that are required to take advantage of opportunities and to resolve any problems.” A detailed overview of the decision process set out in the Handbook accompanies this report. <https://wilderness.org/sites/default/files/Planning%20for%20Leasing%20Overview.pdf>. See H-1624-1, pp. III-10 - III-11.
- 6 See H-1624-1, pp. III-7 - III-8, Instruction Memorandum 2004-089.
- 7 See 43 U.S.C. §§ 1701(a)(7)-(8), 1702(c), 1702(h).
- 8 See Instruction Memorandum 2010-117, p. 2. (“The BLM recognizes that, in some cases, leasing of oil and gas resources may not be consistent with protection of other important resources and values, including units of the National Park System; national wildlife refuges; other specially designated areas; wildlife; and cultural, historic, and paleontological values. Under applicable laws and policies, there is no presumed preference for oil and gas development over other uses.”)
- 9 Bighorn Basin Proposed RMP, p. 3-191.
- 10 See Bighorn Basin Proposed RMP, Appendix S at Table S-1. (“Rationale for Not Managing Lands with Wilderness Characteristics for Naturalness, Outstanding Opportunities for Solitude, and Primitive and Unconfined Recreation, by Field Office and Unit.”) See, e.g., regarding Unit 508 AK: “It is recommended not to manage for wilderness characteristics because of the existing leases for oil and gas.”
- 11 See White River Proposed RMP, pp. 4-289-4-290.
- 12 See Colorado River Valley Proposed RMP, p. 3-135.
- 13 The Congressional Budget Office found that fully one-quarter of leases are issued for the minimum bid of \$2 per acre—meaning the cost of holding public lands is de minimus. See https://www.cbo.gov/sites/default/files/114th-congress-2015-2016/reports/51421-oil_and_gas_options.pdf, p. 18.
- 14 https://www.cbo.gov/sites/default/files/114th-congress-2015-2016/reports/51421-oil_and_gas_options.pdf, p. 2.
- 15 Bighorn Basin Proposed RMP, p. 4-89.
- 16 Kremmling Proposed RMP, p. 2-28.
- 17 Price Proposed RMP, p. 304.
- 18 See BLM Manuals 6310 (Conducting Wilderness Characteristics Inventory of BLM Lands) and 6320 (Considering Lands with Wilderness Characteristics in the BLM Land Use Planning Process).
- 19 43 U.S.C. § 1712(c)(3).
- 20 See BLM Manual 1613 (Areas of Critical Environmental Concern).
- 21 See EA for the KFO June 2014 Competitive Oil & Gas Lease Sale (November 2013) at p. 10 (“According to the Reasonable Foreseeable Development report (RFD), there is low potential for oil and gas development in the location of the Jackson County parcels (BLM, 2008).”); May 2013 Competitive Oil & Gas Lease Sale PDF Maps at p. 2 (showing nominated lease parcels in T. 11 N, R. 76 W, an area with no potential for oil or gas under the 1991 RFD); August 2011 Competitive Oil & Gas Lease Sale Map (showing the location of COC74901 within T. 2 N, 79 W, an area with low or no oil and gas potential under the 1991 RFD); August 2010 Competitive Oil & Gas Lease Sale Map (showing the location of COC74518 within T. 11 N, R. 81 W and within an areas of low or no oil or gas potential under the 1991 RFD); May 2010 Competitive Oil & Gas Lease Sale Map (showing the location of COC74397 within T. 10 N, R. 82 W, an area with low or no oil or gas potential under the 1991 RFD).
- 22 Leases within areas with low or no potential have been protested in at least each of the past three lease sales in the KFO. See CO BLM Lease Sale Archive June 2014, May 2013 and August 2011 lease sale protests.
- 23 See 2008 RFD Report, p. 6 (stating that 210,852 acres of federal mineral estate are currently under lease) and Draft Kremmling RMP Appendix V, p. V-3 (indicating that at least 115,200 acres of low and no potential areas—more than half of the total leased—are under lease in the KFO); see Rocky Mountain Wild, “Oil and Gas Leasing and Development in Colorado as of March 2015.”
- 24 White River Proposed RMP, Table 2-17a-2.
- 25 43 U.S.C. § 1702(c).
- 26 New Mexico Ex. Rel. Richardson v. BLM, 565 F.3d 683, 710 (10th Cir. 2009).
- 27 Instruction Memorandum 2010-117, p. 2.
- 28 See 43 C.F.R. § 3101.1-2 (reasonable measures may be required to minimize adverse impacts on leases); 43 C.F.R. § 2920.7(b)(2) (land use authorizations shall minimize damage to specified environmental resources); BLM Standard Lease Form 3100-11 (lessees “must” conduct their operations so as to minimize adverse impacts); Onshore Order No. 1 §§ IV and III(F)(a)(3) (operators “must” minimize adverse impacts and BLM may require reasonable measures to minimize adverse impacts when APDs are approved); BLM Gold Book (several provisions referencing minimization including a provision to “minimizes undesirable impacts to the environment”).
- 29 See BLM Nevada Preliminary EA for the Dec. 2015 Oil and Gas Lease Sale, p. 1.4.
- 30 H-1624-1, Chapter V, pp. V-1-V-7.
- 31 *Ibid.*, p. V-2.

Our mission is to protect wilderness and inspire Americans to care for our wild places.



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From: Nada Culver
To: "alueders@blm.gov"
Subject: New TWS report - No Exit - being released tomorrow
Date: Monday, June 27, 2016 3:52:06 PM
Attachments: [TWS No Exit Report-FinalDraft-6-23-16.pdf](#)

Hi Amy—I wanted to let you know that The Wilderness Society is releasing a report tomorrow that proposes improvements to the BLM’s approach to planning for oil and gas leasing and development. We’ve often highlighted how the vast majority of public lands and minerals are available to leasing. This report includes some more research into how the agency’s guidance leads to that result, as well as the effects that has on planning and conservation, then provides recommendations as well.

This is our close to final draft and I will send a link to the final version and supporting materials tomorrow but wanted to make sure you saw it ahead of time.

Nada Culver

Senior Counsel and Director, BLM Action Center

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FIXING THE BLM'S Indiscriminate Energy Leasing

Decades of adherence to the belief that all lands should be available for oil and gas leasing has kept our public lands from being protected and put them at unnecessary risk for destruction. It's time to update the BLM's approach and give the public more of a say in managing our public lands.

Introduction

This report describes how the U.S. government agency that oversees 700 million subsurface acres of oil and gas resources on nearly 250 million acres of public lands is saddled with outdated and unbalanced policies, often contradicting its own mandate to manage the land for multiple uses.

Ninety percent of the public lands managed by the Bureau of Land Management are open to open to oil and gas leasing and mineral resources even in areas with little or no potential for developing these resources, compromising potential for protecting wildlife and recreation, while encouraging speculative leasing.

The report provides a series of recommendations that would, if adopted by the BLM, lead to more

balanced decision-making. It lays out specific ways for the agency to better weigh the benefits of leasing a particular area with the potential harm. Such an approach would drive better decisions for the American people, the owners of U.S. public lands.

The Problem

The BLM is not fulfilling its duty to manage public lands for multiple uses.

The Bureau of Land Management rarely closes lands to oil and gas leasing in its resource management plans, despite the risk leasing poses to wildlife, cultural and other valuable resources. But this approach is in conflict with the agency's guiding management principle, the multiple use mandate.



Oil and gas development threaten many of our public lands, like the Pawnee National Grassland in Colorado.
Photo: Mason Cummings/TWS

Common sense would dictate that the BLM close areas with other important values than oil and gas potential, particularly areas unlikely to be developed. But the BLM's internal guidance, and the way that the agency interprets that guidance, has made it extremely difficult to actually close lands to leasing. Instead, the BLM continues to create opportunities for energy speculation at a high cost to recreation, wilderness and wildlife.

An examination of current BLM policies and management practices shows that there is little effort to protect at least some public lands from oil and gas leasing.¹

As a result, the vast majority of U.S. public lands (90 percent) are available for leasing—regardless of whether those lands have other important values that should be protected and regardless of whether the BLM's own data show there is low—or even no—potential for oil and gas. This fundamental flaw in the BLM's guidance has led to a current total of 32 million acres leased for oil and gas development, with less than 13 million under development.²

When public lands with low energy development potential are leased to oil and gas companies,

taxpayers lose out on revenue, as well as other important uses of these lands like recreation and wildlife management. In fact, a Congressional Budget Office report recently concluded that, for parcels leased between 1996 and 2003 (all of which have reached the end of their 10-year exploration period), only about 10 percent of onshore leases issued competitively and three percent of those issued noncompetitively actually entered production.³

The BLM needs to update its approach—it's time to bring 25-year-old policies into this century. In the short term this means issuing immediate guidance for protecting sensitive lands and lands with low energy development potential, and in the long term, commencing a formal revision to BLM's planning guidance.

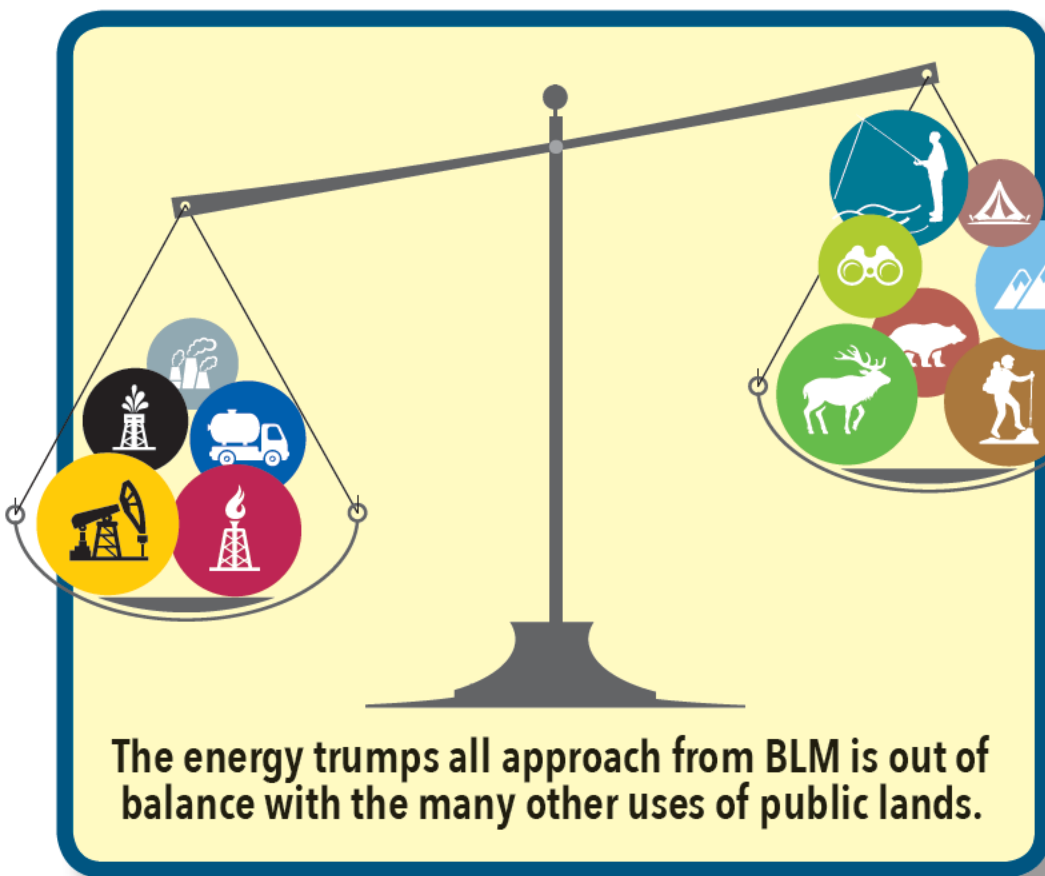
Misguided Guidance

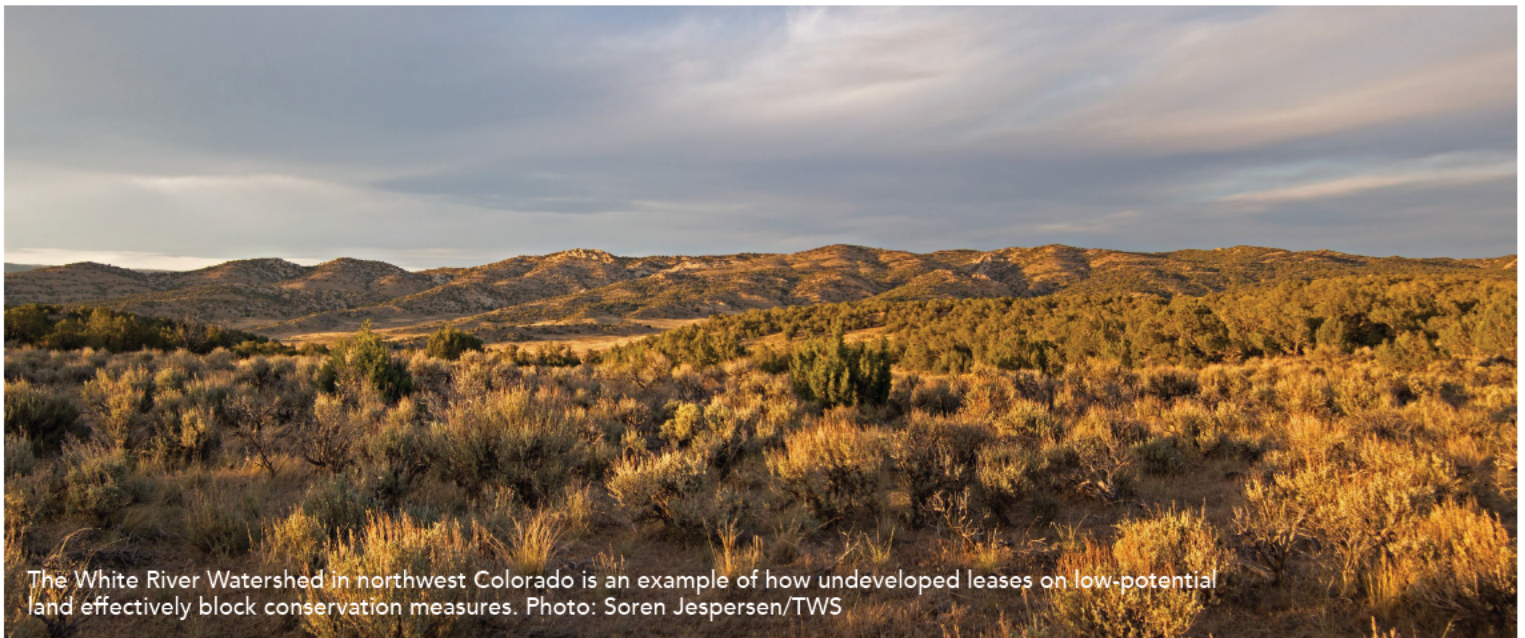
The BLM's handbook and how BLM interprets that handbook are out of step with the agency's guiding principles.

No decisions affect the future of public lands more than those made in BLM resource management plans.

In these plans, created for all public lands being considered for development, the agency sets out management guidelines. Typically, some areas are open for recreation, some are set aside for grazing and others are designated as open or closed to oil and gas leasing. Then different conditions are set forth for how those activities—particularly oil and gas leasing—are to be carried out.

BLM's Handbook on Planning for Fluid Mineral Resources (Handbook H-1624-1⁴) provides guidance to field offices on how to navigate the planning process for oil and gas resources. Under this guidance, field offices are supposed make decisions based on the likelihood of





The White River Watershed in northwest Colorado is an example of how undeveloped leases on low-potential land effectively block conservation measures. Photo: Soren Jespersen/TWS

certain resources being developed in a particular area. They take steps to identify the potential of oil and gas development and to predict where future drilling activity will take place and where impacts from this development will be focused.

This handbook directs the agency staff to formulate management prescriptions for oil and gas resources in light of where recoverable deposits of oil and gas are most likely to exist, referred to as “development potential.”⁵ The handbook, and additional guidance, also direct BLM to project “reasonably foreseeable development,” looking at both potential and “resource conflicts or controversies,” which can form the basis for refining expectations of where development is most likely and appropriate.⁶

However, the agency does not utilize that information to prepare for and address potential resource conflicts at the planning stage. The approach mandated by the mineral resources handbook *should* enable BLM to focus on the areas most likely to be targeted for development, and leave open for other uses the areas with low development potential or the potential to come into conflict with other values.

But under current BLM management policy—despite the guidance in its own handbook—the agency does not close areas with no or low development potential to leasing, regardless of the potential for resource conflict.

In fact, rather than closing areas with high conservation

value which are unlikely to be developed, the agency actually tends to set less protective conditions for leasing in areas with no or low development potential. As a result, resource conflicts are often exacerbated, where they could be avoided.

A Road to Nowhere

The BLM has lost control of leasing and development decisions on the lands it manages, leading to many other problems.

The BLM is required to hold quarterly lease sales; the lands auctioned off are usually nominated by the industry—regardless of the other uses and values of those lands. Once lands are nominated, they will almost certainly be put up for sale. Once they are sold, it is nearly impossible for the BLM to manage them for other uses. As long as most lands are open for leasing, the BLM will continue to have its management policies dictated by the fossil fuel industry.

Allowing oil and gas companies to control the leasing process leads to many other issues:

➡ **It precludes lands from being managed for multiple values.**

The BLM’s mandate to manage our public lands for multiple use and sustained yield requires consideration of a host of natural and cultural resources.⁷ BLM’s

Greater Sage-Grouse: A Conservation Case Study



Greater sage-grouse
Photo: Mason Cummings/TWS

In 2015, the BLM finalized plans for federal lands in 10 states to address conservation of the greater sage-grouse and its habitat—including the threat of oil and gas development. Yet of approximately 104 million acres of federal minerals, only about two percent—were actually closed to oil and gas leasing.

Notably, in many western land management plans written to address greater sage-grouse protection, almost all of the designated priority (high-value) habitat was completely outside of areas with high or medium oil and gas potential (96 percent in Nevada, 100 percent in California, 100 percent in the Idaho/Southwestern Montana plan, 100 percent in Oregon and over 90 percent in Utah). However, none of these plans closed any areas to oil and gas leasing; instead, they remain open to speculative leasing—a lost opportunity to make stronger decisions for conserving the greater sage-grouse.

current guidance reiterates that some lands are more valuable for other uses than for oil and gas leasing,⁸ but the agency's own policies create numerous and daunting obstacles to achieving a balance between development and other uses.

Chief amongst these is the fact that BLM often identifies the presence of development potential and undeveloped leases as precluding other designations and management actions that would otherwise benefit recreation, wilderness and wildlife.

► It impedes meaningful conservation from taking place on sensitive lands.

While leases in low-potential areas (most federal leases) are not likely to be developed, their presence serves to preclude proactive management for other important resources.

For example:

- In the **Bighorn Basin Resource Management Plan in Wyoming**, the BLM considered whether to manage 43 inventoried units, totaling over 476,000 acres, to protect their wilderness characteristics.⁹ But ultimately, none of the units are being managed to protect wilderness characteristics, because they contain oil and gas leases.¹⁰
- In the **White River Resource Management Plan Amendment in Colorado**, the BLM expressly stated that undeveloped leases on low-potential lands had effectively prevented management to protect wilderness characteristics, stating: "139,900 acres of lands with wilderness characteristics have been classified as having low, very low, or no potential....While there is no potential for fluid mineral development in most of the lands with wilderness characteristics units, the majority of the areas, totaling 101,100 acres (59 percent), are already leased for oil and gas development."¹¹
- Similarly, in the **Colorado River Valley Resource Management Plan in Colorado**, the BLM stated it would not manage the Grand Hogback Citizens' Wilderness Proposal for the protection of wilderness characteristics based on the presence

WHY SPECULATIVE LEASING MATTERS

It's putting a majority of our public lands at risk

A staggering amount of lands with low or no oil and gas potential are open to leasing.

Our analysis of areas with low or no potential for oil and gas development shows that the vast majority of these lands are still open to leasing. And they often are leased, presumably with the hope that energy prices will rise, that new ways to extract marginal energy will be found or that the leases could be sold to another company.

The resulting speculative, non-producing leases have precluded forward-thinking, commonsense policies such as managing for wilderness-quality lands and important wildlife habitat.

Our analysis showed that:

- 95 percent of low-, very low- and no-potential lands are open to leasing in the **Bighorn Basin Resource Management Plan in Wyoming**.¹⁵
- 88 percent of low- and no-potential areas are open to leasing in the **Kremmling Resource Management Plan in Colorado**.¹⁶
- 80 percent of low-potential lands are open to leasing in the **Price Resource Management Plan in Utah**.¹⁷
- All of the low-potential sage-grouse habitat is open to leasing in Idaho. No productive oil and gas wells have ever been drilled in Idaho.

It allows a designation double standard

Its easy to get a speculative lease that prevents conservation of environmentally valuable areas, but very difficult to get a designation that would protect them.

For lands to be protected for their wilderness characteristics, an intensive land inventory process must occur. The process seeks to determine if lands meet specific criteria; then a determination of whether they can be managed as wilderness must take place.¹⁸

In the same way, protection and designation of Areas of Critical Environmental Concern (lands with identified important natural and cultural values) are mandated under BLM's governing statute.¹⁹ However, in order to maintain or designate new Areas of Critical Concern in its resource management plans, the BLM requires that an analysis demonstrate the area hold certain relevant and important characteristics that require special management.

Even then, designating the land as an Area of Critical Environmental Concern is only one of the options considered by the agency.²⁰ Consequently, while oil and gas leasing does preclude other management uses, conservation-focused management faces a higher bar. That is an unacceptable double standard.

of oil and gas leases, even though the leases had never been developed.¹²

➔ **It prevents us from effectively achieving our national climate targets.**

Implicit in the decision to leave lands open for development is the lack of consideration of the climate consequences of developing the resources found there—even though the Secretary of the Interior and the Director of the BLM have both called upon the BLM to do more to anticipate and address the contributions of public lands to climate change.

For many reasons, including climate impacts, it is unrealistic and unwise to presume 90 percent of oil and gas resources on public lands should be developed—yet that is precisely the position the BLM takes each time it refuses to close areas to oil and gas leasing.

➔ **It undermines the public's engagement in the land planning process.**

Time and again, public input and polling show that Americans strongly support managing important lands for something other than oil and gas development. But the current practice of keeping oil and gas resources open at any cost conflicts with that input. It is also, as we have shown, out of step with other federal policies directing identification and management of natural and cultural resources and features for conservation purposes.

➔ **It causes poor fiscal stewardship of taxpayer-owned resources.**

Lands are routinely obtained for well below-market value, according to research from the non-partisan Congressional Budget Office, and can be held for a nominal annual fee for the duration of the 10-year lease term.¹³ Oil and gas companies routinely extend the terms of the leases they hold indefinitely through “suspensions,” which can last decades, with no annual fees.

Under these circumstances, it is no surprise that speculation and hoarding of publicly managed oil and gas resources are commonplace. This rampant speculation contributes to the nearly two-thirds of

leased acreage not being developed. Not only is this a waste of the agency resources invested in preparing these leases for sale, it also deprives taxpayers of potential income.

When leases are not developed and not producing, they are not a good investment for the public. Non-producing leases generate less than two percent of total revenue generated by the federal onshore system; 90 percent comes from royalties paid on producing leases.¹⁴

➔ **Other resources are endangered by oil and gas leases that include insufficient protections.**

The Kremmling Field Office in Colorado provides an object lesson in the problems arising from leasing lands with low development potential without meaningful protections. For example, in each of the five lease sales including the Kremmling Field Office from 2010 to 2015, nominations have included low- or no-potential areas.²¹

Lease nominations within low-potential areas are also regularly (and often successfully) protested specifically because of the weak stipulations and lack of protection for other resources. Nominations in the Kremmling Field Office within low or no potential areas were protested based on inadequate protections for fisheries and water quality (June 2014), wildlife (August 2012) and permitted recreation activities (May 2013), and also highlighted the contradiction of BLM putting these resources at risk from speculative leasing and drilling in areas that it had already concluded had no value for oil and gas development.²²

Land within low- and no-potential areas has frequently been leased by the Kremmling Field Office, even though it is rarely drilled. In fact, most active leases issued by the office fall in low or no potential areas, and, unsurprisingly, they are not being actively developed.²³

Better decision-making during the planning process would have helped the BLM avoid administration and preparation cost for lease sales, handle subsequent protests and prevent undue risks to other important resources.

“Well, we know better now. We know that healthy, intact ecosystems are fundamental to the health of our wildlife—and our nation. They clean our air and provide our drinking water, they store carbon and combat climate change, and they are critical to our economy.

But if their integrity is undermined by a haphazard web of transmission lines, pipelines and roads, where does that leave us 50 years from now? Or 500?

It’s an issue that can’t be solved by simply creating a new national park or wildlife refuge—although there’s no doubt that we need those places to serve as critical anchors for conservation.

What we need is smart planning, on a landscape-level, irrespective of manmade lines on a map.

We need to take a holistic look at an ecosystem—on land or in the ocean—to determine where it makes sense to develop, where it makes sense to protect the natural resources, and where we can accomplish both.”

-SECRETARY OF THE INTERIOR, SALLY JEWELL



Continental Divide Trail in Colorado.
Photo: Bob Wick/BLM

Solutions for better management practices

The BLM's policies must reflect the interests of all stakeholders.

The BLM's policies are long overdue for an update that includes input from others besides just the oil and gas industry. A prime example is the agency's Handbook on Planning for Fluid Mineral Resources, which has not been overhauled since 1990.

Both in theory and in practice, the handbook undermines opportunities for protecting lands for other uses, does not provide a path for closing areas to leasing and leads to low- and no-potential areas being open to oil and gas leasing without necessary protections.

BLM's approach to leasing must be updated to reflect the agency's legal mandate, and it must take into account both development potential and conflicts with other resources and users:

➤ **More lands must be closed to oil and gas development.**

BLM plans should set out a framework for oil and gas development that would support closing lands to leases where warranted and opening lands to leasing, with appropriate protections, where development is likely. Lands that have low or no potential for leasing should not be open to leasing unless and until conditions change—an eventuality that BLM has addressed in the Dinosaur Trail Master Leasing Plan:

Leasing within the MLP would progress in phases to address resource values and concerns. Leasing would first occur in the southern portion of the MLP where the oil and gas occurrence potential is rated medium to high. Leasing within...areas of low oil and gas potential... would occur once the BLM has completed additional analysis and planning.²⁴

If the BLM closes or defers leasing in low-potential areas, and conditions change to make development in those areas more likely, the agency can then

complete additional analysis and planning to ensure that development occurs responsibly and accounts for current resource conditions. For example, BLM could commit to completing a master leasing plan in the event that there is demonstrated industry interest in leasing and developing low-potential areas.

By taking a proactive approach to managing oil and gas development as just one of the many uses of our public lands, BLM can also reduce unnecessary costs associated with speculative leasing and undeveloped lands, while making room for designating and managing lands for other uses, such as recreation, wilderness values, and fish and wildlife.

In addition, by taking control of leasing, BLM can better meet other priority goals for land use planning, such as accounting for and managing the contribution of federal lands to climate change and protecting important wildlife migration corridors.

➤ **More balanced management is needed.**

A more thoughtful, realistic approach would be consistent with BLM's mandate to manage the public lands for multiple use and sustained yield.

The agency's governing statute identifies a wide range of uses and values and provides for using lands "for some or all of these resources" and "with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output."²⁵

The courts have ruled that "[i]t is past doubt that the principle of multiple use does not require BLM to prioritize development over other uses."²⁶ Even the BLM itself has made it clear that this is a practice that is out of step with its own directives:

The BLM recognizes that, in some cases, leasing of oil and gas resources may not be consistent with protection of other important resources and values, including units of the National Park System; national wildlife refuges; other specially designated areas; wildlife; and cultural, historic, and paleontological values. **Under applicable laws and policies, there is no presumed preference for oil and gas development over other uses.**²⁷



Photo: Simon Fraser University - flickr

Other aspects of BLM's legal obligations also support limiting or eliminating leasing in low- and no-potential areas, including for purposes of protecting other important resources. For example, BLM is subject to numerous requirements to "minimize" the environmental and other impacts of oil and gas leasing and development.²⁸

Faithfully applying a current understanding of laws and policies would lead to closing more lands to oil and gas leasing, consistent with the agency's multiple use obligations.

 **A smarter approach would have minimal impacts on oil and gas production.**

Modernizing the handbook with an approach that provides for closing lands to leasing and limits leasing in low- or no-potential areas would not only support BLM's obligation to consider managing lands for fish and wildlife, recreation and wilderness values, but also have minimal impacts on industry objectives.

In locations like the Ely District in Nevada, where federal minerals are almost 90 percent open to leasing, only 32 wells were authorized over the past 101 years (as of May 21, 2014), even though there are 936 active leases covering just over two million acres of public land.²⁹

Closing these lands to speculative leasing will not harm responsible oil and gas development. If conditions change so that development in those areas is more likely, BLM can then complete additional analysis and planning to manage additional development. For example, BLM could commit to completing a master leasing plan in the event that there is demonstrated industry interest in leasing and developing low potential areas.

 **The BLM's own master leasing plans provide a working model for improved management.**

The BLM has already taken a more proactive and prescriptive approach to managing oil and gas leasing and development through master leasing plans. Incorporate practices such as closing lands to leasing to minimize resource conflicts and requiring phasing of leasing and development to reflect priorities while also limiting damage to other resources.³⁰ As the handbook

states, "The MLP establishes a guiding framework for the development of the area and provides a vision for how future development will proceed."³¹

These tools and concepts could be scaled up to inform agency decision-making at the land-use planning level.

Recommendations

These policy recommendations provide an exit from the "energy trumps all" path the BLM is currently pursuing.

We recommend these specific steps be taken:

1. INTERIM GUIDANCE SHOULD BE ISSUED IMMEDIATELY.

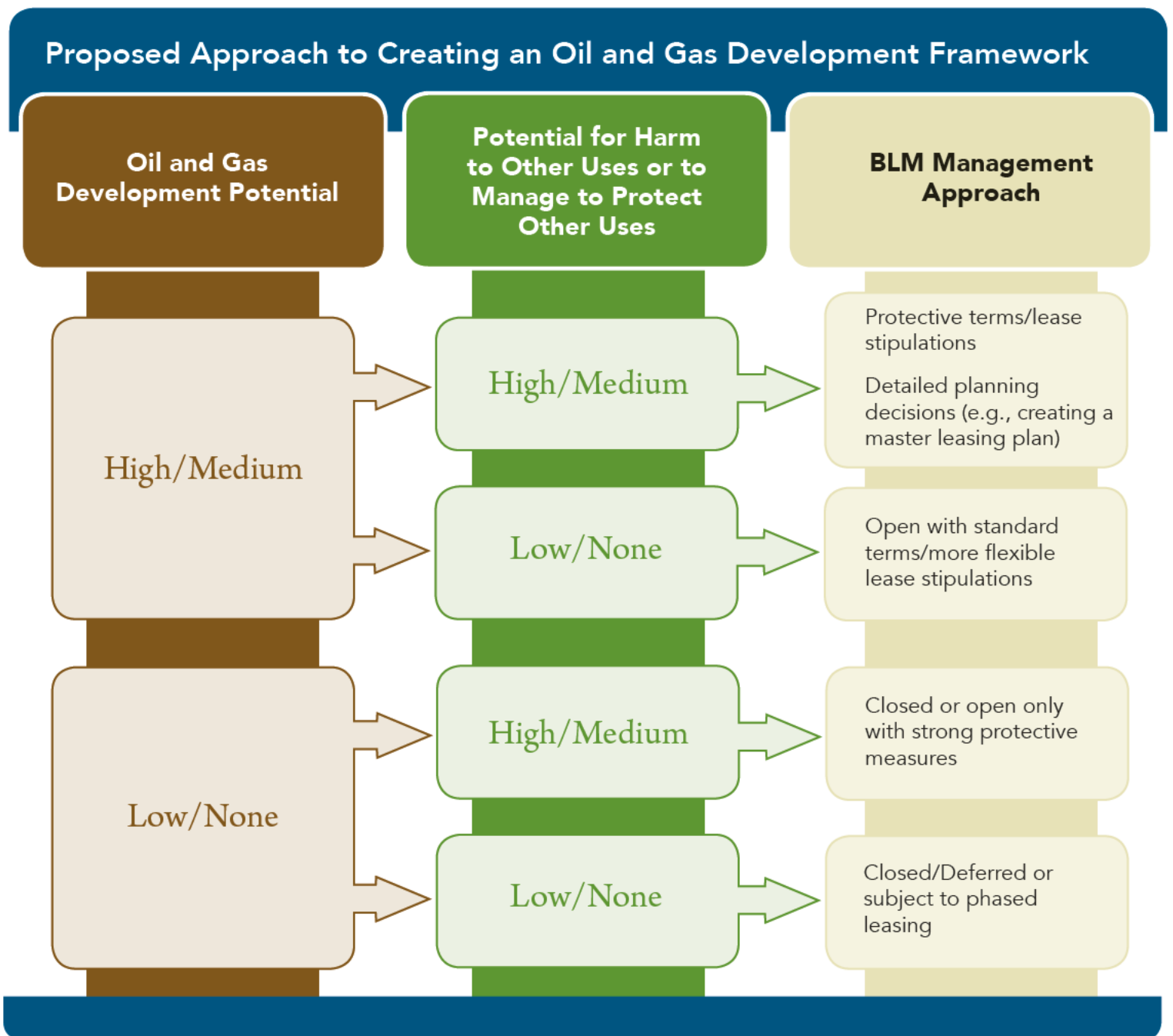
To clarify the manner in which Handbook 1624-1 should be applied in preparing resource management plans, guidance should be issued that:

- a. There is no presumption that lands should be available for oil and gas leasing; rather, determinations should be based on resource potential, likely conflicts and potential harm to other resources or uses.
- b. The BLM should collect and update information on development potential, likely impacts of development on other resources and uses, and possible designations or management priorities that would conflict with leasing. Based on this information, the BLM should construct a development framework taking into account support for a variety of resources and uses.
- c. Lands that have high or medium development potential should be considered for designation as available for leasing, but with appropriate protections where other uses or resources are present—and with the understanding that some lands with high or medium potential may still be better suited to management for other uses.
- d. Lands that have low or no development potential should be considered for closure or deferral pursuant to phased leasing, with the understanding that where there is a significant potential for other uses to be supported by closure or harmed by development, these lands should be closed.

2. THE HANDBOOK ON PLANNING FOR FLUID MINERAL RESOURCES SHOULD BE UPDATED TO CLARIFY AND INCORPORATE THESE KEY CONCEPTS AS SOON AS POSSIBLE.

3. INTERIM GUIDANCE ON EVALUATING LEASE SALE NOMINATIONS SHOULD BE ISSUED TO ADDRESS THE CURRENT IMBALANCE AND SIGNIFICANT PROBLEMS THE HANDBOOK HAS ALREADY GENERATED. When assessing lease proposals under existing resource management plans where more than 75 percent of minerals are open for leasing, BLM should take a hard look at whether decisions on availability for leasing would have been made differently based on current guidance.

An updated approach to planning for oil and gas leasing should meaningfully account for development potential and conflicts with other resources, as depicted in the below table.



- 1 A more in-depth study accompanies this report. <https://wilderness.org/resource/no-exit-fixing-blm%E2%80%99s-indiscriminate-energy-leasing-whitepaper>
- 2 http://www.blm.gov/style/medialib/blm/wo/MINERALS_REALTY_AND_RESOURCE_PROTECTION_/energy/oil_gas_statistics/data_sets.Par.69959.File.dat/summary.pdf
- 3 https://www.cbo.gov/sites/default/files/114th-congress-2015-2016/reports/51421-oil_and_gas_options.pdf, p. 19.
- 4 http://www.blm.gov/style/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.44374.File.dat/H_1624_1.pdf
- 5 There are eight steps set out in the handbook, which focus first on identifying existing conditions and potential, as well as the impacts that would arise from oil and gas development if existing management remains in place. In the process of formulating alternatives to the existing management, the handbook directs the BLM to focus on how to maximize keeping lands open to leasing, stating that alternatives should be “exploring opportunities for enhancing or expanding resources or resource uses” and will “identify any subsurface management constraints or mitigating measures that are required to take advantage of opportunities and to resolve any problems.” A detailed overview of the decision process set out in the Handbook accompanies this report. <https://wilderness.org/sites/default/files/Planning%20for%20Leasing%20Overview.pdf>. See H-1624-1, pp. III-10 - III-11.
- 6 See H-1624-1, pp. III-7 - III-8, Instruction Memorandum 2004-089.
- 7 See 43 U.S.C. §§ 1701(a)(7)-(8), 1702(c), 1702(h).
- 8 See Instruction Memorandum 2010-117, p. 2. (“The BLM recognizes that, in some cases, leasing of oil and gas resources may not be consistent with protection of other important resources and values, including units of the National Park System; national wildlife refuges; other specially designated areas; wildlife; and cultural, historic, and paleontological values. Under applicable laws and policies, there is no presumed preference for oil and gas development over other uses.”)
- 9 Bighorn Basin Proposed RMP, p. 3-191.
- 10 See Bighorn Basin Proposed RMP, Appendix S at Table S-1. (“Rationale for Not Managing Lands with Wilderness Characteristics for Naturalness, Outstanding Opportunities for Solitude, and Primitive and Unconfined Recreation, by Field Office and Unit.”) See, e.g., regarding Unit 508 AK: “It is recommended not to manage for wilderness characteristics because of the existing leases for oil and gas.”
- 11 See White River Proposed RMP, pp. 4-289-4-290.
- 12 See Colorado River Valley Proposed RMP, p. 3-135.
- 13 The Congressional Budget Office found that fully one-quarter of leases are issued for the minimum bid of \$2 per acre—meaning the cost of holding public lands is de minimus. See https://www.cbo.gov/sites/default/files/114th-congress-2015-2016/reports/51421-oil_and_gas_options.pdf, p. 18.
- 14 https://www.cbo.gov/sites/default/files/114th-congress-2015-2016/reports/51421-oil_and_gas_options.pdf, p. 2.
- 15 Bighorn Basin Proposed RMP, p. 4-89.
- 16 Kremmling Proposed RMP, p. 2-28.
- 17 Price Proposed RMP, p. 304.
- 18 See BLM Manuals 6310 (Conducting Wilderness Characteristics Inventory of BLM Lands) and 6320 (Considering Lands with Wilderness Characteristics in the BLM Land Use Planning Process).
- 19 43 U.S.C. § 1712(c)(3).
- 20 See BLM Manual 1613 (Areas of Critical Environmental Concern).
- 21 See EA for the KFO June 2014 Competitive Oil & Gas Lease Sale (November 2013) at p. 10 (“According to the Reasonable Foreseeable Development report (RFD), there is low potential for oil and gas development in the location of the Jackson County parcels (BLM, 2008).”); May 2013 Competitive Oil & Gas Lease Sale PDF Maps at p. 2 (showing nominated lease parcels in T. 11 N, R. 76 W, an area with no potential for oil or gas under the 1991 RFD); August 2011 Competitive Oil & Gas Lease Sale Map (showing the location of COC74901 within T. 2 N, 79 W, an area with low or no oil and gas potential under the 1991 RFD); August 2010 Competitive Oil & Gas Lease Sale Map (showing the location of COC74518 within T. 11 N, R. 81 W and within an areas of low or no oil or gas potential under the 1991 RFD); May 2010 Competitive Oil & Gas Lease Sale Map (showing the location of COC74397 within T. 10 N, R. 82 W, an area with low or no oil or gas potential under the 1991 RFD).
- 22 Leases within areas with low or no potential have been protested in at least each of the past three lease sales in the KFO. See CO BLM Lease Sale Archive June 2014, May 2013 and August 2011 lease sale protests.
- 23 See 2008 RFD Report, p. 6 (stating that 210,852 acres of federal mineral estate are currently under lease) and Draft Kremmling RMP Appendix V, p. V-3 (indicating that at least 115,200 acres of low and no potential areas—more than half of the total leased—are under lease in the KFO); see Rocky Mountain Wild, “Oil and Gas Leasing and Development in Colorado as of March 2015.”
- 24 White River Proposed RMP, Table 2-17a-2.
- 25 43 U.S.C. § 1702(c).
- 26 New Mexico Ex. Rel. Richardson v. BLM, 565 F.3d 683, 710 (10th Cir. 2009).
- 27 Instruction Memorandum 2010-117, p. 2.
- 28 See 43 C.F.R. § 3101.1-2 (reasonable measures may be required to minimize adverse impacts on leases); 43 C.F.R. § 2920.7(b)(2) (land use authorizations shall minimize damage to specified environmental resources); BLM Standard Lease Form 3100-11 (lessees “must” conduct their operations so as to minimize adverse impacts); Onshore Order No. 1 §§ IV and III(F)(a)(3) (operators “must” minimize adverse impacts and BLM may require reasonable measures to minimize adverse impacts when APDs are approved); BLM Gold Book (several provisions referencing minimization including a provision to “minimize undesirable impacts to the environment”).
- 29 See BLM Nevada Preliminary EA for the Dec. 2015 Oil and Gas Lease Sale, p. 1.4.
- 30 H-1624-1, Chapter V, pp. V-1-V-7.
- 31 *Ibid.*, p. V-2.

Our mission is to protect wilderness and inspire Americans to care for our wild places.



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Washington, D.C. 20036

(202) 833-2300

wilderness.org

From: Boyd, David
Subject: News Release: BLM Takes Important Next Step Toward Long-Term Protection of the Roan Plateau
Date: Tuesday, June 28, 2016 3:03:50 PM
Attachments: [image.png](#)
[Roan Plateau Final SEIS news release 6.28.16.pdf](#)



News Release

Colorado River Valley Field Office, Colorado

June 28, 2016

Contact: David Boyd, Public Affairs Specialist, (970) 876-9008

BLM Takes Important Next Step Toward Long-Term Protection of the Roan Plateau

Agency Releases Final Supplement EIS Carrying Forward Landmark Settlement Agreement That Balanced Resource Protection and Ongoing Oil & Gas Development

SILT, Colo. – The Bureau of Land Management (BLM) today released the Final Supplemental Environmental Impact Statement (SEIS) and Proposed Plan Amendment (Proposed Plan) for the Roan Plateau. The SEIS and Proposed Plan address the longstanding issues surrounding oil and gas development and resource management on and around the Plateau. They also address concerns raised in a 2012 judicial decision and the landmark 2014 settlement agreement that resolved that litigation.

“The release of the Final EIS puts us one step closer to finally resolving the controversy surrounding the Roan Plateau,” said BLM Director Neil Kornze. “It implements the vision put forward in 2014 by a group of local, state and industry leaders, as well as sportsmen and conservationists, by protecting some of Colorado’s most important fish and wildlife habitat while also allowing for the responsible development of the oil and gas resources in the areas where it makes the most sense.”

The Roan Plateau is considered one of Colorado’s most ecologically diverse landscapes. It is a popular destination for hunting, fishing and backcountry recreation. The dramatic topography of the plateau is known for its spectacular cliffs, waterfalls and box canyons, as well as the array of game and sensitive species found there. Originally set aside as Naval Oil Shale Reserves #1 and #3 in the 1910s, the Roan Plateau was transferred to the BLM in 1997 from the Department of Energy with directions to lease the area for oil and gas development as soon as practicable, while protecting the wildlife, water, and other natural resources. The transferred lands totaled 56,238 acres and the legislation required that the 12,029-acre area below the rim, which already contained wells, be leased within a year.

“The release of the Final SEIS represents the penultimate step in the BLM’s fulfillment of its commitments under the Roan settlement,” said Colorado State Director Ruth Welch. “We are looking forward to achieving a final resolution of this important project.”

Under the BLM's Proposed Plan, the area atop the plateau where 17 oil and gas leases were canceled as part of the 2014 settlement would be closed to leasing. As for the two leases on top and 12 below the rim that were retained under the settlement, those areas would remain open to leasing and development subject to the terms and conditions of those leases and the new stipulations identified in the SEIS.

The Final SEIS was prepared based on the more than 50,000 public comments received on the Draft SEIS. The vast majority of those comments urged the BLM to follow the 2014 settlement.

The Final SEIS is available online at www.blm.gov/co/crvfo. The publication of the Environmental Protection Agency's Notice of Availability for the Final SEIS on July 1, 2016, will start a 30-day protest period and a Governor's consistency review period. All protests must be in writing and mailed to one of the following addresses:

Regular Mail:
BLM Director (210)
Attention: Protest Coordinator
P.O. Box 71383
Washington, D.C. 20024-1383

Overnight Delivery:
BLM Director (210)
Attention: Protest Coordinator
20 M Street SE, Room 2134LM
Washington, D.C. 20003

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

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David Boyd

Bureau of Land Management
Public Affairs Specialist
NW Colorado District

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U.S. Department of the Interior
Bureau of Land Management



News Release

Colorado River Valley Field Office, Colorado

June 28, 2016

Contact: David Boyd, Public Affairs Specialist, (970) 876-9008

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###

From: St George, Brian
To: [Luke Schafer](#); [Scott Braden](#); [Nada Culver](#); [Alex Daue](#); [Juli Slivka](#)
Subject: Final version of BLM Colorado's step down LWC policy
Date: Wednesday, June 29, 2016 1:54:59 PM
Attachments: [LWC Policy IM CO-2016-023ATT1.pdf](#)
[LWC Policy IM CO-2016-023.pdf](#)

Gentlefolk,

Attached you will find our finalized guidance to the field offices and districts in implementing national LWC policy.

Please don't hesitate to call me if you have questions.

Cheers,

~ bsg

Brian St George
Deputy State Director for Resources and Fire
BLM Colorado State Office
m (970) 275-2215
o (303) 239-3768

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BLM Colorado: Statewide Supplemental Lands with Wilderness Characteristics Guidance

Background

It is often necessary for BLM Field Offices to maintain and update resource inventory information to ensure adequate data is available to support decision making. Inventory updates are often performed when a land use plan is being revised, and they can also be updated at any other time to ensure that the baseline information is current and relevant. This is especially important when using this information to perform an analysis for the National Environmental Policy Act (NEPA). One of the resource inventories that need to be updated regularly is lands with wilderness characteristics. Lands with wilderness characteristics, while a seemingly new concept to many, have been recognized as a distinct resource since the passage of the Federal Land Policy and Management Act of 1976 (FLPMA), and should be considered equally with all other resources present in a Field Office. Section 201 of FLPMA requires the BLM to maintain, on a continuing basis, an inventory of all public lands and their resources and other values, including wilderness characteristics. To assure that a consistent approach is taken on this matter, the BLM issued guidance in an instruction memorandum in July of 2011, and formally developed this information into the following manuals in March of 2012:

Manual 6310 – Conducting Wilderness Characteristics Inventory on BLM Lands

Manual 6320 – Considering Lands with Wilderness Characteristics in Land Use Plans

These lands with wilderness characteristics policies evolved concurrently with the development of many land use plans in BLM Colorado. Manuals 6310 and 6320 direct the BLM to consider and evaluate inventory information submitted by the public in a timely manner. In BLM Colorado, many of the inventory submittals were received midway through planning efforts and, in some cases, could not be fully incorporated into the baseline information used to make planning level decisions. There is currently little direction on how to consider management of areas found to possess wilderness characteristics that were not analyzed through an RMP process. Nor is there clear direction in the guidance on how to assess impacts to lands with wilderness characteristics from proposed projects, as is required through NEPA. This guidance and associated Internal Memorandum (IM) is intended to provide direction and further clarification on that provided in BLM Manuals 6310 and 6320.

In an effort to ensure that the BLM has the most up to date information to use in analysis and decision making, this policy has been developed to guide BLM in updating and maintaining its inventory of lands with wilderness characteristics. This policy is also intended to provide staff with a decision framework for determining how to analyze potential impacts to lands with wilderness characteristics through the NEPA process and to consider potential management options outside of the land use planning process. The following direction outlines the steps BLM Colorado will take to ensure that wilderness characteristics are considered appropriately at all levels of the NEPA analysis and that all available information is used to inform the inventory process.

This direction is divided into three parts. Part I identifies the process by which BLM Colorado will ensure inventories are up to date and considers all available information while determining if lands with wilderness characteristics is an issue for analysis in relevant NEPA processes. Part II will assist BLM Colorado in considering management options for lands with wilderness through the project-level NEPA process during implementation of

an RMP. Part III will provide guidance on how to appropriately analyze impacts to wilderness characteristics where potential resource conflicts exist.

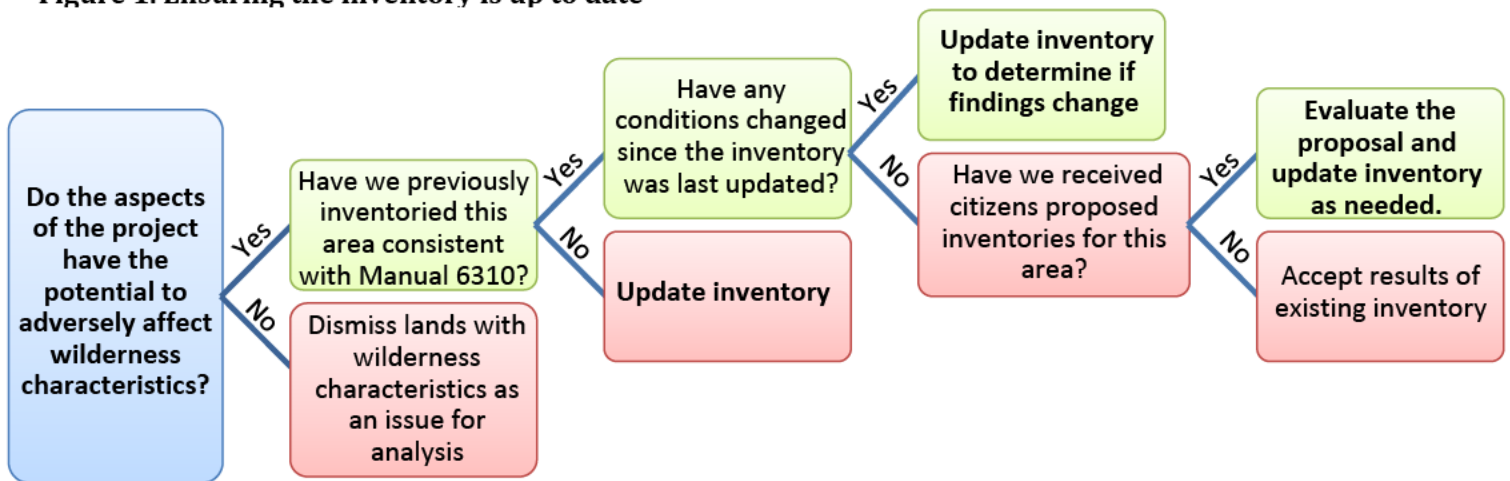
Part I - Maintaining and Updating Inventories

It is important that field offices continue to prioritize completion and maintenance of inventories of lands with wilderness characteristics, particularly when new information in the form of citizen’s proposals has been received. Failure to update inventories may violate our policies and may compromise commitments to our external partners. In addition to this ongoing process, BLM Colorado commits to ensuring that inventories of potentially affected lands are completed and documented before approving any activities that may adversely impact potential lands with wilderness characteristics. Following submittal of a project proposal that would potentially cause negative impacts to lands with wilderness characteristics, consider the following procedures in Figure 1 and Figure 2 to ensure proper consideration of the issue and documentation of the findings.

First the BLM should follow the procedures in Figure 1 to determine if the inventory needs to be updated. No update is necessary if the resource specialist determines that there is no potential for adverse impacts to lands with wilderness characteristics from the proposed action. This determination should be carefully documented in the project file and/or the NEPA document as an issue considered but dismissed from further analysis.

If the specialist determines that an update is necessary, follow the procedures outlined in BLM Manual 6310 for documentation of the inventory process. Post results of the updated inventory to the website and notify submitters of the citizen’s inventory of the results. If the updated inventory shows that no lands with wilderness characteristics exist in the project area, dismiss the issue from further analysis. If the updated inventory shows that lands with wilderness characteristics are determined to be present and have the potential to be impacted, follow the procedures in Part II.

Figure 1. Ensuring the inventory is up to date



Inventory Maintenance

Regardless of past inventory efforts, BLM must maintain and update as necessary, its inventory of wilderness resources on public lands. It is not uncommon for conditions relating to wilderness characteristics to change over time. Permitted projects in lands with wilderness characteristics areas may have had impacts to the inventoried resource, resulting in a reduction, or elimination of, individual characteristics. Conversely, an area that was once determined to lack wilderness characteristics may now possess them due to natural or intentional reclamation activities. The following circumstances, or “triggers”, help to determine when to consider if updates to an existing wilderness characteristics inventory are necessary:

1. The public or the BLM identifies wilderness characteristics as an issue for analysis during the National Environmental Policy Act (NEPA) process.
2. The BLM is undertaking a land use planning process (i.e., Land use plan revision or amendment).
3. A project that has the potential to impact wilderness characteristics is proposed.
4. The BLM receives new information concerning resource conditions, including wilderness characteristics information submitted by the public that meets the BLM’s minimum standard described in BLM Manual 6310.
5. The BLM acquires additional lands.

There may be other circumstances in which BLM will find it appropriate to update its wilderness characteristics inventory. At a minimum, Field Offices should confirm that existing inventories are up to date when there is reason to believe that any action will adversely impact the existing or potential wilderness characteristics of an area.

Further, the BLM has an obligation to review any new wilderness characteristics information submitted by the public and make a determination if the submitted information meets the Minimum Standards for Review of New Information as outlined in BLM Manual 6310, Section .06, Subsection B1. This minimum standards review should be performed within 30 days of receipt of the new information. Upon completion of the review, the Field Office should respond, via written correspondence, to the public who submitted the information as to the validity of the new information and if it meets the minimum standards for further review.

We recognize that the task of performing updates to an inventory, particularly in response to large amounts of new information submitted by the public, may present staffing and budget challenges to Field Offices. As a matter of routine business practice, Field Offices should plan to routinely update existing inventories when any of the triggers listed above necessitate an update. Not all submittals from the public will require a full update of the inventory; however, some form of documentation of the review of their information should be included in the inventory. If, due to the receipt of large amounts of new information from the public, updating existing inventories will result in a significant burden on staff-time and budget, the field office should develop a plan of action and associated timeline for completing the inventory updates. Considerations for prioritizing areas to complete inventory updates include:

- Areas for which projects have already been proposed through a NEPA process
- Well known or potentially controversial areas
- Areas that have a high probability for future proposed actions in NEPA

If, after prioritizing projects, Field Offices determine they do not have the internal capacity to complete inventory updates in a reasonably responsive time frame, they should seek assistance from the District Office, State Office and Washington Office. This assistance may be provided in the form of additional budget, or through other means, such as BLM interns or seasonal employees. If the inventory update is required specifically for an external or proponent-driven project, then Field Offices may also seek to request that the cost of the completion of the inventory update be funded by that proponent (i.e., as cost recovery). The Field Office should ensure that all inventories completed by third parties meet the standards identified in BLM Manual 6310 prior to acceptance of the findings.

In order to maintain consistency across the state and to ensure compliance with Manual 6310, the Colorado State Office National Conservation Lands Program Lead will review all new and updated inventory findings prior to making the information available to the public. The review will be brief in order to prevent delay of ongoing NEPA analyses and will focus on the inventory procedures rather than the final determination, which is the responsibility of the authorized officer.

Making Inventory Information Available to the Public

All BLM Field Offices should make finalized and signed wilderness characteristics inventory findings available to the public as soon as practicable *after* their completion and *before* the inventory data is used to inform decisions. This should occur no later than the publication of any draft NEPA analysis associated with an action. These forms should be made available on each Field Office's own webpage, with a dedicated link specifically for lands with wilderness characteristics so that it is easy for the public to locate. Hard copies of all documentation should also be kept in the Field Office.

At a minimum, the following items should be displayed on BLM's webpage for **every** lands with wilderness characteristics unit that was inventoried:

- Forms 1 and 2 in Appendix B of BLM Manual 6310
- A map of each inventoried area, clearly depicting the general location of the area, the boundaries of the area, and any routes that have been cherry-stemmed out of the unit
- Documentation of any updates to the inventory for the unit (including maps)

It is also recommended that each Field Office display on their webpage the following items:

- An overall map of all units that were analyzed and inventoried
- A summary of the methodology and process the Field Office followed in conducting the inventory
- A summary of all updates to the inventory performed during that calendar year

While not required, Field Offices may also want to display the following items on the webpage. If not displayed online, hard copies or electronic files of these items should be readily available upon request by the public:

- Photo documentation associated with the inventories
- Maps depicting the location of photo points
- Route analysis forms used in the inventory analysis

Field Office lands with wilderness characteristics webpages, including summary inventory updates and updated maps, should be kept current. At a minimum, webpages should be updated on an annual basis.

Field Offices should provide notification to the submitters of inventory information that was used to inform inventory updates when these updates are available on the website.

Resource Management Plan Maintenance and Amendments

The RMP is not required to be updated as a result of updating the inventory. The updated inventory is a change to the existing environment but does not change management decisions in the RMP. A plan amendment would be required if the authorized officer determines that a change in land use planning allocations and management actions are necessary to protect an area with wilderness characteristics. The RMP analyzed the existing environment with the information we had available at the time of analysis. New NEPA analysis should incorporate new information as it becomes available. New analyses should consider the full context of the updated inventory and any new additions as it relates to the proposed actions.

Part II: Consideration of Lands with Wilderness Characteristics during Implementation.

Consideration of Management Options for Lands with Wilderness Characteristics During Implementation Level NEPA Analysis

This section assumes that the inventory is up to date, including incorporation of citizen's proposed inventory information; and that lands with wilderness characteristics have the potential to be impacted by a proposed project or management action. Figure 2 identifies the steps needed to ensure that lands with wilderness characteristics are managed and analyzed appropriately at the implementation stage.

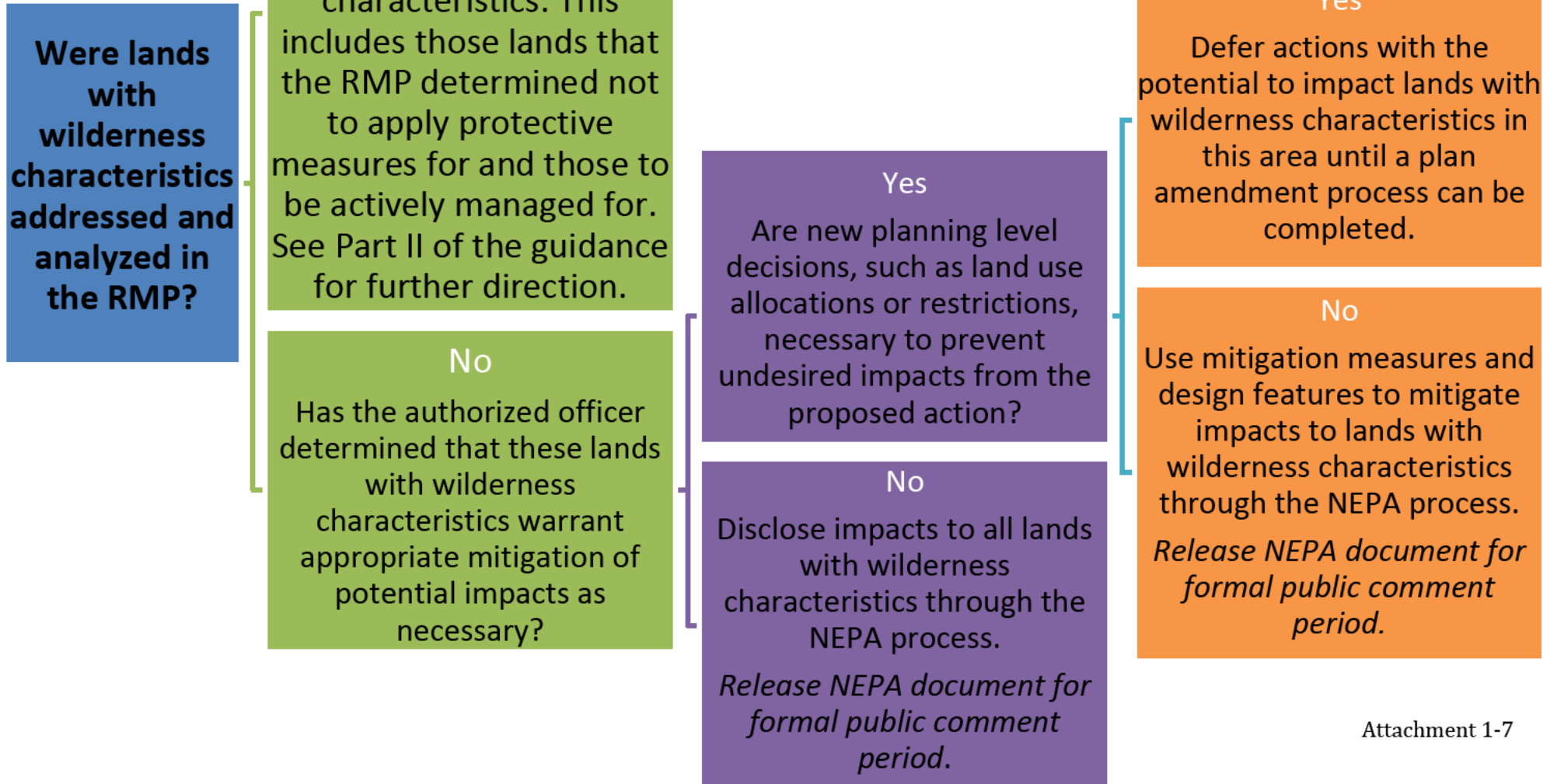
First the Field Office must determine if the area was previously analyzed as part of an RMP revision or an amendment process. If the RMP considered management of the area within the range of alternatives analyzed in the EIS, the Field Office will follow the management prescriptions as identified in the Approved RMP. This could mean applying protective measures for areas managed to protect lands with wilderness characteristics, allowing impacts consistent with a tiered approach, or allowing impacts in lands not managed to protect wilderness characteristics.

If the area was not addressed through an RMP revision or amendment, the authorized officer must determine if the new information about the presence of lands with wilderness characteristics warrants specific management or protection not already provided by the RMP. This should include consideration of the other resource values and uses present. It is not necessary to initiate a planning decision to determine that lands with wilderness characteristics do not warrant further protection.

If the authorized officer determines that protection is warranted for the area, they should determine whether existing resource protection measures are sufficient to mitigate impacts from the proposed activity or if planning level decisions are necessary to protect the area. Not all protection measures may require a plan amendment. An authorized officer could determine that an area warrants protection but that existing planning decisions (i.e. No Surface Occupancy stipulations) or site-specific mitigation are adequate to mitigate potential impacts. This may satisfy protection from some proposed actions but may not protect from all uses. The authorized officer could still determine that new allocations and management actions are necessary to manage the area, which would initiate a land use plan amendment. Interim management of the area should be to defer all activities that cannot be adequately mitigated with existing management decisions until such time that an amendment can be completed.

The authorized officer will consider potential adverse impacts to lands with wilderness characteristics through the NEPA process for a proposed project. A NEPA process considering potential impacts to an area not previously considered for protection in a land use planning process should analyze alternative management options for the area including an alternative that analyzes protection of wilderness characteristics. This could be accomplished through analysis of the No Action alternative and/or an action alternative proposing mitigation of adverse impacts to lands with wilderness characteristics. Analysis of the proposed action or any alternatives should disclose the potential adverse impacts to lands with wilderness characteristics from approval of the activities. NEPA documents will be released for formal public comment when analyzing potential adverse impacts to lands with wilderness characteristics not previously considered in an RMP analysis. The decision record for the project should identify the rationale for the final decision on whether or not to allow impacts.

Figure 2.
Consideration of
Lands with Wilderness
Characteristics in
Implementation Level
NEPA



Part III: Analyzing Potential Impacts to Lands with Wilderness Characteristics through the NEPA Process

To date, there is no established standard or metric for which to assess direct and indirect impacts from proposed project actions to lands with wilderness characteristics while conducting a NEPA analysis. However, using the individual inventory criteria defined in BLM Manual 6310 as a guide, combined with referencing the existing lands with wilderness characteristics inventory reports for the affected area, reviewers should be able to accurately describe and analyze the impacts.

Potential impacts should be analyzed for each individual wilderness characteristic determined to be present in the inventoried unit. The nature of these characteristics should be described in the narrative of the inventory reports for each specific area determined to have lands with wilderness characteristics. Careful consideration should be given to assessing impacts and a determination made as to the magnitude and duration of the potential effects. For example, if the project is a proposed non-motorized trail that winds through a lands with wilderness characteristics unit, it would be appropriate to make a determination if the project is temporary or long-term (in this case a trail would be a long-term impact) and determine if the project is consistent with the defining characteristics of the area (would it provide additional opportunities for solitude or take away from opportunities for solitude, or would the project provide additional opportunities for primitive types of recreation or remove those opportunities). Would the project negatively impact the naturalness of an area? If so, what is the magnitude of this impact (e.g., the impact would be minimal because the design of the trail would limit bank cuts and prohibit the use of built structures).

Assessing the presence or absence of impacts, and determining the magnitude of those impacts, is an analytical process and should be approached independently for each new proposed project and for each inventoried lands with wilderness characteristics unit. The reviewer should also determine whether the impacts from the proposed project are so great that the area would no longer meet the inventory criteria; or conversely, determine whether the impacts are isolated and the impact to the unit as a whole is minimal, thereby not affecting the determination that the area possesses wilderness characteristics.

Below are some additional questions to consider for each inventory criteria when conducting an impact assessment for lands with wilderness characteristics.

1. **Size:** Would the proposed action bisect the unit so that there are no longer 5,000 acres or more of contiguous BLM lands? If so, would the area still meet one of the other size criteria as defined in BLM Manual 6310, Section .06, Subsection C, 2(a), i (2)?
2. **Naturalness:** Does the proposed action affect the unit so that it no longer appears to be affected primarily by the forces of nature?
 - a. Does the proposed action affect the area so that it no longer appears to have been affected primarily by the forces of nature, and so that any work of human beings is no longer substantially unnoticeable? (Note -- examples of human-made features that may be considered substantially unnoticeable in certain cases are: trails, trail signs, bridges, fire breaks, pit toilets, fisheries enhancement facilities, fire rings, historic properties, archaeological resources, hitching posts, snow gauges, water quantity and quality measuring devices, research monitoring markers and devices, minor radio repeater sites, air quality monitoring devices, fencing, spring developments, barely

- b. Visible linear disturbances, and stock ponds). Although individually these facilities may not substantially affect naturalness, their impacts should also be assessed cumulatively.
 - c. Describe human impacts that will remain after the project is completed. Document noticeable human impacts that will be added to the area. If several minor impacts will be added, does their cumulative effect on the area's degree of apparent naturalness reach a threshold that would make the area no longer meet the naturalness criterion?
3. **Solitude and Primitive and Unconfined Recreation:** Does the proposed action affect the area so that it no longer provides outstanding opportunities for solitude or primitive and unconfined types of recreation? (Note—An area does not need to contain outstanding opportunities for both solitude and primitive and unconfined types of recreation, only one the two. Additionally, an area does not need to possess outstanding opportunities on every acre).
- a. *Solitude:* Determine if the proposed action affects the area so that it would remove, or preclude, outstanding opportunities for solitude. Would the proposed action create a situation whereby a visitor would not be able to avoid the sights, sounds and evidence of other people in the area? Factors or elements of a proposed action that may influence a visitor's solitude include distance between areas of frequent visitation, vegetative screening around the proposed action, topography of the area around the proposed action, likelihood that the project will attract significant additional public visitation, and the ability of visitors to avoid the proposed action and find seclusion in other parts of the inventory unit.
 - b. *Primitive and Unconfined Recreation:* Determine if the proposed action affects the area in such a way that it prevents or removes outstanding opportunities for primitive and unconfined types of recreation. Would the proposed action impair the qualities of the primitive and unconfined recreation opportunities to the degree that they would no longer be outstanding? Examples of primitive and unconfined types of recreation include hiking, backpacking, fishing, hunting, spelunking, horseback riding, climbing, river running, cross-country skiing, snowshoeing, dog sledding, photography, bird watching, canoeing, kayaking, sailing, and sightseeing for botanical, zoological, or geological features, among others. (Note—It is important to reference the inventory report for an area when determining a proposed action's effect on primitive and unconfined types of recreation. Some areas may provide outstanding opportunities for a diversity of primitive and unconfined recreational activities possible in the area, or simply for the outstanding quality of one opportunity).

Supplemental Values: Does the proposed action negatively impact any supplemental values which were inventoried for the area? Determine and document any potential impacts to inventoried supplemental values of the area. (Note—The presence of supplemental values are not required for an area to be considered as containing lands with wilderness characteristics. As such, if there are impacts to the supplemental values of an area, but to none of the other inventoried criteria, the determination of whether the area possesses wilderness characteristics would be unaffected. It may be necessary to consider the impacts to the supplemental values in their respective resource sections in the NEPA document if impacted. You may reference the other resource section for these impacts if applicable.

**UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
COLORADO STATE OFFICE
2850 YOUNGFIELD STREET
LAKEWOOD, COLORADO 80215-7093**

In Reply Refer To:
1210 (CO-931) P

June 20, 2016

EMS TRANSMISSION 06/20/2016
Instruction Memorandum No. CO-2016-023
Expires: 09/30/2019

To: District and Field Managers

From: State Director

Subject: Additional Guidance Regarding Lands with Wilderness Characteristics
Inventory Information and the Land Use Planning Process

Program Area: Wilderness - Wilderness Characteristics Inventory and Land Use
Planning Process

Purpose: Bureau of Land Management (BLM) Manual No. 6310, Conducting Wilderness Characteristics Inventory on BLM Lands, and BLM Manual No. 6320, Considering Lands with Wilderness Characteristics in Land Use Plans were issued in March, 2012. This Instruction Memorandum provides additional guidance to BLM Colorado in updating, maintaining, and using its inventory of lands with wilderness characteristics. This guidance is intended to provide staff with a decision framework for determining how to analyze potential impacts to lands with wilderness characteristics through the National Environmental Policy Act (NEPA) process and to consider potential management options outside of the land use planning process. This guidance also outlines the steps BLM Colorado will take to ensure that wilderness characteristics are considered appropriately at all levels of the NEPA analysis and that all available information is used to inform the inventory process.

Policy/Action: BLM Colorado will follow the guidance in the attachment when considering lands with wilderness characteristics in the NEPA process. The guidance is divided into three parts. Part I identifies the process by which BLM Colorado will ensure that inventories are up to date and consider all available information when determining if lands with wilderness characteristics is an issue for analysis in relevant NEPA processes. Part II assists BLM Colorado in considering management options for lands with wilderness through the project-level NEPA process during implementation of an RMP.

Part III provides guidance on how to appropriately analyze impacts to wilderness characteristics where potential resource conflicts exist.

Timeframe: Effective immediately.

Budget Impact: This guidance may require additional staff time during the development of a NEPA document. The additional time needed to comply with this guidance is nominal and should not represent an adverse budget impact.

Background: It is often necessary for BLM field offices to maintain and update resource inventory information to ensure adequate data is available to support decision making. Inventory updates are often performed when a land use plan is being revised, and they can also be updated at any other time to ensure the baseline information is current and relevant. This is especially important when using this information to perform NEPA analysis. One of the resource inventories that needs to be updated regularly is lands with wilderness characteristics. Lands with wilderness characteristics have been recognized as a distinct resource since the passage of the Federal Land Policy and Management Act of 1976 (FLPMA), and should be considered equally along with all other resources present in a field office. Section 201 of FLPMA requires the BLM to maintain, on a continuing basis, an inventory of all public lands and their resources and other values, including wilderness characteristics. To assure that a consistent approach is taken on this matter, the BLM issued guidance in an instruction memorandum in July 2011, and formally developed this information into the following manuals in March 2012:

Manual 6310 – *Conducting Wilderness Characteristics Inventory on BLM Lands*

Manual 6320 – *Considering Lands with Wilderness Characteristics in Land Use Plans*

These lands with wilderness characteristics policies evolved concurrently with the development of many land use plans in BLM Colorado. Manuals 6310 and 6320 direct the BLM to consider and evaluate inventory information submitted by the public in a timely manner. In Colorado, many of the inventory submissions were received midway through planning efforts and, in some cases, could not be fully incorporated into the baseline information used to make planning level decisions. The new BLM Colorado policy provides direction on how to consider management of areas found to possess wilderness characteristics that were not analyzed through an RMP process. It also provides guidance on how to assess impacts to lands with wilderness characteristics from proposed projects, as is required through NEPA.

Directives Affected: None.

Coordination: Coordinated and developed with input from all District and Field Offices and CO-930.

Contact: Please direct all questions to Chad Schneckenburger, BLM Colorado National Conservation Lands Program Coordinator, at (303) 239-3738, cschneckenburger@blm.gov.

Signed by:
Gregory P. Shoop
Associate State Director

Authenticated by:
Brian Klein
Branch of Information Services

1 Attachment:

1 – [BLM Colorado Statewide Supplemental Lands with Wilderness Characteristics Guidance \(9 pp\)](#)

From: Nada Culver
To: St George, Brian; mastouff@blm.gov; cschneckenburger@blm.gov
Subject: FW: Final version of BLM Colorado's step down LWC policy
Date: Thursday, June 30, 2016 10:00:59 AM
Attachments: [LWC Policy IM CO-2016-023ATT1.pdf](#)
[LWC Policy IM CO-2016-023.pdf](#)

Hi Team – Having had a chance to read through this and appreciate the wonder of Megan’s flowcharts in action, I wanted to let you know how impressed and appreciative we all are to see this guidance. This is going to be really helpful for getting everyone on the same page and seeing the national lands with wilderness characteristics guidance so expertly interpreted and clearly applied to our specific situations in Colorado. Thank you so much for all the hard work that went into this. We’re pretty proud to be working in the first state to figure this one out – and hope you are, too.

Nada Culver

Senior Counsel and Director, BLM Action Center

The Wilderness Society

1660 Wynkoop, #850

Denver, CO 80202

Main: 303-650-5818

Direct: 303-225-4635

Nada_Culver@tw.s.org <mailto:Nada_Culver@tw.s.org>

From: St George, Brian [<mailto:bstgeorg@blm.gov>]
Sent: Wednesday, June 29, 2016 11:55 AM
To: luke.conservationco; Scott Braden; Nada Culver; Alex Daue; Juli Slivka
Subject: Final version of BLM Colorado's step down LWC policy

Gentlefolk,

Attached you will find our finalized guidance to the field offices and districts in implementing national LWC policy.

Please don't hesitate to call me if you have questions.

Cheers,

~ bsg

Brian St George

Deputy State Director for Resources and Fire

BLM Colorado State Office

m (970) 275-2215

o (303) 239-3768

Click here to follow us on social media! <http://www.blm.gov/co/st/en/BLM_Information/social_media.html>

BLM Colorado: Statewide Supplemental Lands with Wilderness Characteristics Guidance

Background

It is often necessary for BLM Field Offices to maintain and update resource inventory information to ensure adequate data is available to support decision making. Inventory updates are often performed when a land use plan is being revised, and they can also be updated at any other time to ensure that the baseline information is current and relevant. This is especially important when using this information to perform an analysis for the National Environmental Policy Act (NEPA). One of the resource inventories that need to be updated regularly is lands with wilderness characteristics. Lands with wilderness characteristics, while a seemingly new concept to many, have been recognized as a distinct resource since the passage of the Federal Land Policy and Management Act of 1976 (FLPMA), and should be considered equally with all other resources present in a Field Office. Section 201 of FLPMA requires the BLM to maintain, on a continuing basis, an inventory of all public lands and their resources and other values, including wilderness characteristics. To assure that a consistent approach is taken on this matter, the BLM issued guidance in an instruction memorandum in July of 2011, and formally developed this information into the following manuals in March of 2012:

Manual 6310 – Conducting Wilderness Characteristics Inventory on BLM Lands

Manual 6320 – Considering Lands with Wilderness Characteristics in Land Use Plans

These lands with wilderness characteristics policies evolved concurrently with the development of many land use plans in BLM Colorado. Manuals 6310 and 6320 direct the BLM to consider and evaluate inventory information submitted by the public in a timely manner. In BLM Colorado, many of the inventory submittals were received midway through planning efforts and, in some cases, could not be fully incorporated into the baseline information used to make planning level decisions. There is currently little direction on how to consider management of areas found to possess wilderness characteristics that were not analyzed through an RMP process. Nor is there clear direction in the guidance on how to assess impacts to lands with wilderness characteristics from proposed projects, as is required through NEPA. This guidance and associated Internal Memorandum (IM) is intended to provide direction and further clarification on that provided in BLM Manuals 6310 and 6320.

In an effort to ensure that the BLM has the most up to date information to use in analysis and decision making, this policy has been developed to guide BLM in updating and maintaining its inventory of lands with wilderness characteristics. This policy is also intended to provide staff with a decision framework for determining how to analyze potential impacts to lands with wilderness characteristics through the NEPA process and to consider potential management options outside of the land use planning process. The following direction outlines the steps BLM Colorado will take to ensure that wilderness characteristics are considered appropriately at all levels of the NEPA analysis and that all available information is used to inform the inventory process.

This direction is divided into three parts. Part I identifies the process by which BLM Colorado will ensure inventories are up to date and considers all available information while determining if lands with wilderness characteristics is an issue for analysis in relevant NEPA processes. Part II will assist BLM Colorado in considering management options for lands with wilderness through the project-level NEPA process during implementation of

an RMP. Part III will provide guidance on how to appropriately analyze impacts to wilderness characteristics where potential resource conflicts exist.

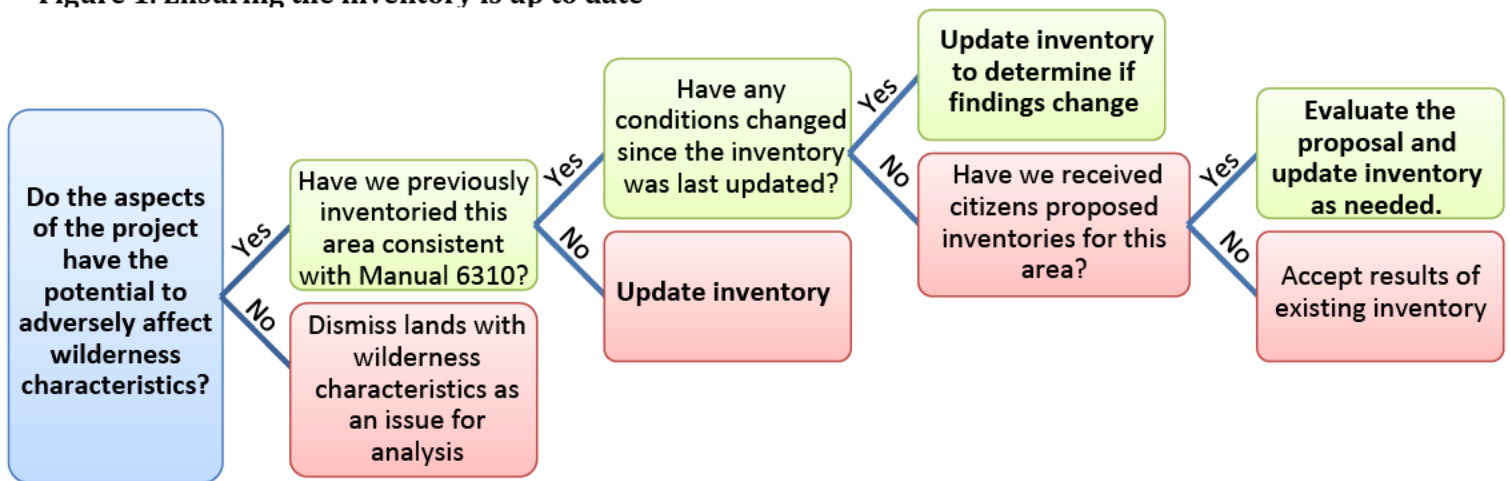
Part I - Maintaining and Updating Inventories

It is important that field offices continue to prioritize completion and maintenance of inventories of lands with wilderness characteristics, particularly when new information in the form of citizen’s proposals has been received. Failure to update inventories may violate our policies and may compromise commitments to our external partners. In addition to this ongoing process, BLM Colorado commits to ensuring that inventories of potentially affected lands are completed and documented before approving any activities that may adversely impact potential lands with wilderness characteristics. Following submittal of a project proposal that would potentially cause negative impacts to lands with wilderness characteristics, consider the following procedures in Figure 1 and Figure 2 to ensure proper consideration of the issue and documentation of the findings.

First the BLM should follow the procedures in Figure 1 to determine if the inventory needs to be updated. No update is necessary if the resource specialist determines that there is no potential for adverse impacts to lands with wilderness characteristics from the proposed action. This determination should be carefully documented in the project file and/or the NEPA document as an issue considered but dismissed from further analysis.

If the specialist determines that an update is necessary, follow the procedures outlined in BLM Manual 6310 for documentation of the inventory process. Post results of the updated inventory to the website and notify submitters of the citizen’s inventory of the results. If the updated inventory shows that no lands with wilderness characteristics exist in the project area, dismiss the issue from further analysis. If the updated inventory shows that lands with wilderness characteristics are determined to be present and have the potential to be impacted, follow the procedures in Part II.

Figure 1. Ensuring the inventory is up to date



Inventory Maintenance

Regardless of past inventory efforts, BLM must maintain and update as necessary, its inventory of wilderness resources on public lands. It is not uncommon for conditions relating to wilderness characteristics to change over time. Permitted projects in lands with wilderness characteristics areas may have had impacts to the inventoried resource, resulting in a reduction, or elimination of, individual characteristics. Conversely, an area that was once determined to lack wilderness characteristics may now possess them due to natural or intentional reclamation activities. The following circumstances, or “triggers”, help to determine when to consider if updates to an existing wilderness characteristics inventory are necessary:

1. The public or the BLM identifies wilderness characteristics as an issue for analysis during the National Environmental Policy Act (NEPA) process.
2. The BLM is undertaking a land use planning process (i.e., Land use plan revision or amendment).
3. A project that has the potential to impact wilderness characteristics is proposed.
4. The BLM receives new information concerning resource conditions, including wilderness characteristics information submitted by the public that meets the BLM’s minimum standard described in BLM Manual 6310.
5. The BLM acquires additional lands.

There may be other circumstances in which BLM will find it appropriate to update its wilderness characteristics inventory. At a minimum, Field Offices should confirm that existing inventories are up to date when there is reason to believe that any action will adversely impact the existing or potential wilderness characteristics of an area.

Further, the BLM has an obligation to review any new wilderness characteristics information submitted by the public and make a determination if the submitted information meets the Minimum Standards for Review of New Information as outlined in BLM Manual 6310, Section .06, Subsection B1. This minimum standards review should be performed within 30 days of receipt of the new information. Upon completion of the review, the Field Office should respond, via written correspondence, to the public who submitted the information as to the validity of the new information and if it meets the minimum standards for further review.

We recognize that the task of performing updates to an inventory, particularly in response to large amounts of new information submitted by the public, may present staffing and budget challenges to Field Offices. As a matter of routine business practice, Field Offices should plan to routinely update existing inventories when any of the triggers listed above necessitate an update. Not all submittals from the public will require a full update of the inventory; however, some form of documentation of the review of their information should be included in the inventory. If, due to the receipt of large amounts of new information from the public, updating existing inventories will result in a significant burden on staff-time and budget, the field office should develop a plan of action and associated timeline for completing the inventory updates. Considerations for prioritizing areas to complete inventory updates include:

- Areas for which projects have already been proposed through a NEPA process
- Well known or potentially controversial areas
- Areas that have a high probability for future proposed actions in NEPA

If, after prioritizing projects, Field Offices determine they do not have the internal capacity to complete inventory updates in a reasonably responsive time frame, they should seek assistance from the District Office, State Office and Washington Office. This assistance may be provided in the form of additional budget, or through other means, such as BLM interns or seasonal employees. If the inventory update is required specifically for an external or proponent-driven project, then Field Offices may also seek to request that the cost of the completion of the inventory update be funded by that proponent (i.e., as cost recovery). The Field Office should ensure that all inventories completed by third parties meet the standards identified in BLM Manual 6310 prior to acceptance of the findings.

In order to maintain consistency across the state and to ensure compliance with Manual 6310, the Colorado State Office National Conservation Lands Program Lead will review all new and updated inventory findings prior to making the information available to the public. The review will be brief in order to prevent delay of ongoing NEPA analyses and will focus on the inventory procedures rather than the final determination, which is the responsibility of the authorized officer.

Making Inventory Information Available to the Public

All BLM Field Offices should make finalized and signed wilderness characteristics inventory findings available to the public as soon as practicable *after* their completion and *before* the inventory data is used to inform decisions. This should occur no later than the publication of any draft NEPA analysis associated with an action. These forms should be made available on each Field Office's own webpage, with a dedicated link specifically for lands with wilderness characteristics so that it is easy for the public to locate. Hard copies of all documentation should also be kept in the Field Office.

At a minimum, the following items should be displayed on BLM's webpage for **every** lands with wilderness characteristics unit that was inventoried:

- Forms 1 and 2 in Appendix B of BLM Manual 6310
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It is also recommended that each Field Office display on their webpage the following items:

- An overall map of all units that were analyzed and inventoried
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- A summary of all updates to the inventory performed during that calendar year

While not required, Field Offices may also want to display the following items on the webpage. If not displayed online, hard copies or electronic files of these items should be readily available upon request by the public:

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Field Office lands with wilderness characteristics webpages, including summary inventory updates and updated maps, should be kept current. At a minimum, webpages should be updated on an annual basis.

Field Offices should provide notification to the submitters of inventory information that was used to inform inventory updates when these updates are available on the website.

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Part II: Consideration of Lands with Wilderness Characteristics during Implementation.

Consideration of Management Options for Lands with Wilderness Characteristics During Implementation Level NEPA Analysis

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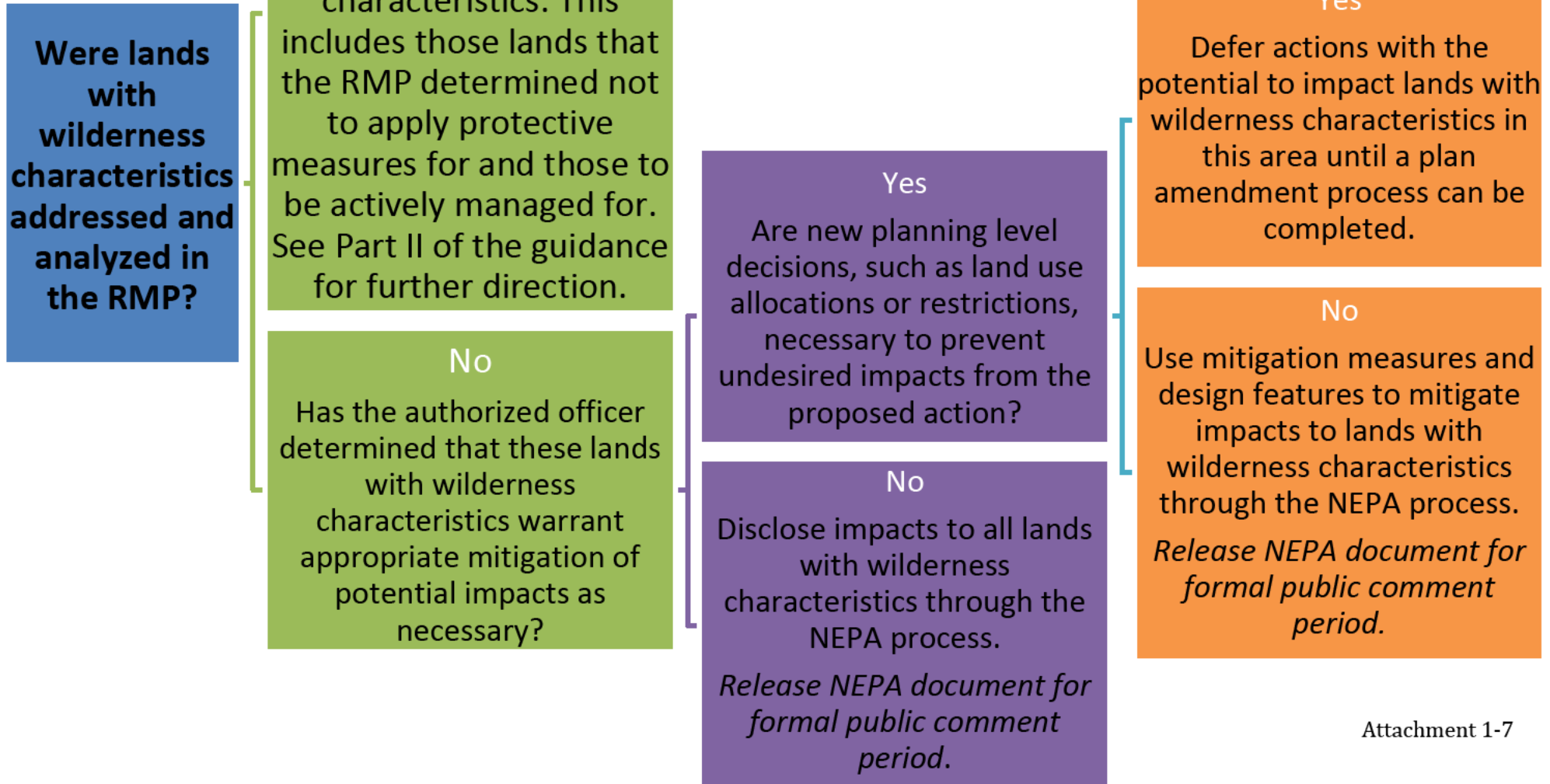
First the Field Office must determine if the area was previously analyzed as part of an RMP revision or an amendment process. If the RMP considered management of the area within the range of alternatives analyzed in the EIS, the Field Office will follow the management prescriptions as identified in the Approved RMP. This could mean applying protective measures for areas managed to protect lands with wilderness characteristics, allowing impacts consistent with a tiered approach, or allowing impacts in lands not managed to protect wilderness characteristics.

If the area was not addressed through an RMP revision or amendment, the authorized officer must determine if the new information about the presence of lands with wilderness characteristics warrants specific management or protection not already provided by the RMP. This should include consideration of the other resource values and uses present. It is not necessary to initiate a planning decision to determine that lands with wilderness characteristics do not warrant further protection.

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The authorized officer will consider potential adverse impacts to lands with wilderness characteristics through the NEPA process for a proposed project. A NEPA process considering potential impacts to an area not previously considered for protection in a land use planning process should analyze alternative management options for the area including an alternative that analyzes protection of wilderness characteristics. This could be accomplished through analysis of the No Action alternative and/or an action alternative proposing mitigation of adverse impacts to lands with wilderness characteristics. Analysis of the proposed action or any alternatives should disclose the potential adverse impacts to lands with wilderness characteristics from approval of the activities. NEPA documents will be released for formal public comment when analyzing potential adverse impacts to lands with wilderness characteristics not previously considered in an RMP analysis. The decision record for the project should identify the rationale for the final decision on whether or not to allow impacts.

Figure 2.
Consideration of
Lands with Wilderness
Characteristics in
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Part III: Analyzing Potential Impacts to Lands with Wilderness Characteristics through the NEPA Process

To date, there is no established standard or metric for which to assess direct and indirect impacts from proposed project actions to lands with wilderness characteristics while conducting a NEPA analysis. However, using the individual inventory criteria defined in BLM Manual 6310 as a guide, combined with referencing the existing lands with wilderness characteristics inventory reports for the affected area, reviewers should be able to accurately describe and analyze the impacts.

Potential impacts should be analyzed for each individual wilderness characteristic determined to be present in the inventoried unit. The nature of these characteristics should be described in the narrative of the inventory reports for each specific area determined to have lands with wilderness characteristics. Careful consideration should be given to assessing impacts and a determination made as to the magnitude and duration of the potential effects. For example, if the project is a proposed non-motorized trail that winds through a lands with wilderness characteristics unit, it would be appropriate to make a determination if the project is temporary or long-term (in this case a trail would be a long-term impact) and determine if the project is consistent with the defining characteristics of the area (would it provide additional opportunities for solitude or take away from opportunities for solitude, or would the project provide additional opportunities for primitive types of recreation or remove those opportunities). Would the project negatively impact the naturalness of an area? If so, what is the magnitude of this impact (e.g., the impact would be minimal because the design of the trail would limit bank cuts and prohibit the use of built structures).

Assessing the presence or absence of impacts, and determining the magnitude of those impacts, is an analytical process and should be approached independently for each new proposed project and for each inventoried lands with wilderness characteristics unit. The reviewer should also determine whether the impacts from the proposed project are so great that the area would no longer meet the inventory criteria; or conversely, determine whether the impacts are isolated and the impact to the unit as a whole is minimal, thereby not affecting the determination that the area possesses wilderness characteristics.

Below are some additional questions to consider for each inventory criteria when conducting an impact assessment for lands with wilderness characteristics.

1. **Size:** Would the proposed action bisect the unit so that there are no longer 5,000 acres or more of contiguous BLM lands? If so, would the area still meet one of the other size criteria as defined in BLM Manual 6310, Section .06, Subsection C, 2(a), i (2)?
2. **Naturalness:** Does the proposed action affect the unit so that it no longer appears to be affected primarily by the forces of nature?
 - a. Does the proposed action affect the area so that it no longer appears to have been affected primarily by the forces of nature, and so that any work of human beings is no longer substantially unnoticeable? (Note -- examples of human-made features that may be considered substantially unnoticeable in certain cases are: trails, trail signs, bridges, fire breaks, pit toilets, fisheries enhancement facilities, fire rings, historic properties, archaeological resources, hitching posts, snow gauges, water quantity and quality measuring devices, research monitoring markers and devices, minor radio repeater sites, air quality monitoring devices, fencing, spring developments, barely

- b. Visible linear disturbances, and stock ponds). Although individually these facilities may not substantially affect naturalness, their impacts should also be assessed cumulatively.
 - c. Describe human impacts that will remain after the project is completed. Document noticeable human impacts that will be added to the area. If several minor impacts will be added, does their cumulative effect on the area's degree of apparent naturalness reach a threshold that would make the area no longer meet the naturalness criterion?
3. **Solitude and Primitive and Unconfined Recreation:** Does the proposed action affect the area so that it no longer provides outstanding opportunities for solitude or primitive and unconfined types of recreation? (Note—An area does not need to contain outstanding opportunities for both solitude and primitive and unconfined types of recreation, only one the two. Additionally, an area does not need to possess outstanding opportunities on every acre).
- a. *Solitude:* Determine if the proposed action affects the area so that it would remove, or preclude, outstanding opportunities for solitude. Would the proposed action create a situation whereby a visitor would not be able to avoid the sights, sounds and evidence of other people in the area? Factors or elements of a proposed action that may influence a visitor's solitude include distance between areas of frequent visitation, vegetative screening around the proposed action, topography of the area around the proposed action, likelihood that the project will attract significant additional public visitation, and the ability of visitors to avoid the proposed action and find seclusion in other parts of the inventory unit.
 - b. *Primitive and Unconfined Recreation:* Determine if the proposed action affects the area in such a way that it prevents or removes outstanding opportunities for primitive and unconfined types of recreation. Would the proposed action impair the qualities of the primitive and unconfined recreation opportunities to the degree that they would no longer be outstanding? Examples of primitive and unconfined types of recreation include hiking, backpacking, fishing, hunting, spelunking, horseback riding, climbing, river running, cross-country skiing, snowshoeing, dog sledding, photography, bird watching, canoeing, kayaking, sailing, and sightseeing for botanical, zoological, or geological features, among others. (Note—It is important to reference the inventory report for an area when determining a proposed action's effect on primitive and unconfined types of recreation. Some areas may provide outstanding opportunities for a diversity of primitive and unconfined recreational activities possible in the area, or simply for the outstanding quality of one opportunity).

Supplemental Values: Does the proposed action negatively impact any supplemental values which were inventoried for the area? Determine and document any potential impacts to inventoried supplemental values of the area. (Note—The presence of supplemental values are not required for an area to be considered as containing lands with wilderness characteristics. As such, if there are impacts to the supplemental values of an area, but to none of the other inventoried criteria, the determination of whether the area possesses wilderness characteristics would be unaffected. It may be necessary to consider the impacts to the supplemental values in their respective resource sections in the NEPA document if impacted. You may reference the other resource section for these impacts if applicable.

**UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
COLORADO STATE OFFICE
2850 YOUNGFIELD STREET
LAKEWOOD, COLORADO 80215-7093**

In Reply Refer To:
1210 (CO-931) P

June 20, 2016

EMS TRANSMISSION 06/20/2016
Instruction Memorandum No. CO-2016-023
Expires: 09/30/2019

To: District and Field Managers

From: State Director

Subject: Additional Guidance Regarding Lands with Wilderness Characteristics
Inventory Information and the Land Use Planning Process

Program Area: Wilderness - Wilderness Characteristics Inventory and Land Use
Planning Process

Purpose: Bureau of Land Management (BLM) Manual No. 6310, Conducting Wilderness Characteristics Inventory on BLM Lands, and BLM Manual No. 6320, Considering Lands with Wilderness Characteristics in Land Use Plans were issued in March, 2012. This Instruction Memorandum provides additional guidance to BLM Colorado in updating, maintaining, and using its inventory of lands with wilderness characteristics. This guidance is intended to provide staff with a decision framework for determining how to analyze potential impacts to lands with wilderness characteristics through the National Environmental Policy Act (NEPA) process and to consider potential management options outside of the land use planning process. This guidance also outlines the steps BLM Colorado will take to ensure that wilderness characteristics are considered appropriately at all levels of the NEPA analysis and that all available information is used to inform the inventory process.

Policy/Action: BLM Colorado will follow the guidance in the attachment when considering lands with wilderness characteristics in the NEPA process. The guidance is divided into three parts. Part I identifies the process by which BLM Colorado will ensure that inventories are up to date and consider all available information when determining if lands with wilderness characteristics is an issue for analysis in relevant NEPA processes. Part II assists BLM Colorado in considering management options for lands with wilderness through the project-level NEPA process during implementation of an RMP.

Part III provides guidance on how to appropriately analyze impacts to wilderness characteristics where potential resource conflicts exist.

Timeframe: Effective immediately.

Budget Impact: This guidance may require additional staff time during the development of a NEPA document. The additional time needed to comply with this guidance is nominal and should not represent an adverse budget impact.

Background: It is often necessary for BLM field offices to maintain and update resource inventory information to ensure adequate data is available to support decision making. Inventory updates are often performed when a land use plan is being revised, and they can also be updated at any other time to ensure the baseline information is current and relevant. This is especially important when using this information to perform NEPA analysis. One of the resource inventories that needs to be updated regularly is lands with wilderness characteristics. Lands with wilderness characteristics have been recognized as a distinct resource since the passage of the Federal Land Policy and Management Act of 1976 (FLPMA), and should be considered equally along with all other resources present in a field office. Section 201 of FLPMA requires the BLM to maintain, on a continuing basis, an inventory of all public lands and their resources and other values, including wilderness characteristics. To assure that a consistent approach is taken on this matter, the BLM issued guidance in an instruction memorandum in July 2011, and formally developed this information into the following manuals in March 2012:

Manual 6310 – *Conducting Wilderness Characteristics Inventory on BLM Lands*

Manual 6320 – *Considering Lands with Wilderness Characteristics in Land Use Plans*

These lands with wilderness characteristics policies evolved concurrently with the development of many land use plans in BLM Colorado. Manuals 6310 and 6320 direct the BLM to consider and evaluate inventory information submitted by the public in a timely manner. In Colorado, many of the inventory submissions were received midway through planning efforts and, in some cases, could not be fully incorporated into the baseline information used to make planning level decisions. The new BLM Colorado policy provides direction on how to consider management of areas found to possess wilderness characteristics that were not analyzed through an RMP process. It also provides guidance on how to assess impacts to lands with wilderness characteristics from proposed projects, as is required through NEPA.

Directives Affected: None.

Coordination: Coordinated and developed with input from all District and Field Offices and CO-930.

Contact: Please direct all questions to Chad Schneckenburger, BLM Colorado National Conservation Lands Program Coordinator, at (303) 239-3738, cschneckenburger@blm.gov.

Signed by:
Gregory P. Shoop
Associate State Director

Authenticated by:
Brian Klein
Branch of Information Services

1 Attachment:

1 – [BLM Colorado Statewide Supplemental Lands with Wilderness Characteristics Guidance \(9 pp\)](#)

From: Witt, Ryan
To: [Barron, Mark S.](#)
Subject: FOIA Scope Clarification
Date: Friday, July 1, 2016 11:46:45 AM

Mr Barron,

Here are the compiled clarifying questions from our state and field offices:

For Item 2:

" . . . all communications and correspondence between any BLM officials, employees, representatives, or agents and any third party regarding: . . . " Is there a specific definition of whom you would consider "third party?"

For Item 3:

What is meant by "planning, hosting, and conducting of oil and gas lease sales of parcels"? Are you referring to the planning, hosting, conducting of the actual sale or are you referring to the entire lease sale process including the environmental analysis, public comments, protests, etc?

Questions for Alaska:

Under the Mineral Leasing Act (MLA) oil and gas lease sales that are conducted by oral auction in the lower 48. Their process for the MLA sales are much different than for NPR-A. The BLM does not hold MLA lease sales in Alaska at this time.

The NPR-A sales are sealed bid and held under a different authority than the Mineral Leasing Act. BLM issues a "Call for Nominations" with a Federal Register notice. For a sale, the BLM publishes a Federal Register notice announcing the sale.

How would this affect the records you are seeking from the AK State Office?

General questions:

Are the requests for “communications and correspondence” about lease sales limited to communications about specific lease sales? (That is: not about lease sales generally.)

Are all communications, document, drafts, etc. related to Environmental Assessments included in the scope? (Requests for “communications and correspondence” about lease sales; request 3b for “all analyses”). Would the final EA suffice ?

Narrowed Scope of the request to Eastern States:

The Eastern States FOIA Office indicated that in a conference call you narrowed the request for EOIs to a four-column spreadsheet of EOI information, rather than the EOIs themselves, showing "Operator", "Date", "State", and "Status" for EOIs received after January 1, 2014. To capture pre-2014 EOI statistics, MB agreed to a report showing the number of all EOI's, by state. Is this correct? Does this apply to all of the states where you made this request?

The Eastern States FOIA Office indicated that instead of "all communications", you were seeking "Official Communications." Is this correct? Does this apply to all of the states where you made this request?

Thank you,

Ryan Witt
FOIA Officer
Bureau of Land Management

Direct: (202) 912-7562
Email: rwitt@blm.gov

From: Barron, Mark S.
To: [Witt, Ryan](#)
Subject: RE: FOIA Scope Clarification
Date: Wednesday, July 6, 2016 2:54:40 PM

Good Afternoon Ryan,

Please see the Alliance's responses to the questions you transmitted in red below. Please provide a response regarding when the Alliance will receive responsive information no later than 5:00 pm EDT on July 7, 2016.

Regards,
MB

From: Witt, Ryan [mailto:rwitt@blm.gov]
Sent: Friday, July 01, 2016 9:47 AM
To: Barron, Mark S.
Subject: FOIA Scope Clarification

Mr Barron,

Here are the compiled clarifying questions from our state and field offices:

For Item 2:

" . . . all communications and correspondence between any BLM officials, employees, representatives, or agents and any third party regarding: . . . " Is there a specific definition of whom you would consider "third party?"

The request incorporates the traditional, dictionary definition of "third-party," i.e., any entity that is not affiliated with BLM. That should include, but not necessarily be limited to, vendors, suppliers, venue-operators, oil and gas operators, government officials (whether federal, state, or local), non-governmental organizations, or individual members of the public.

For Item 3:

What is meant by "planning, hosting, and conducting of oil and gas lease sales of parcels"? Are you referring to the planning, hosting, conducting of the actual sale or are you referring to the entire lease sale process including the environmental analysis, public comments, protests, etc?

This request seeks information related to the actual lease sale. If planning for a particular sale involves accommodations for protests, demonstrations, public comment, or other public participation associated with a specific lease sale, that information would be relevant and responsive to the inquiry.

Questions for Alaska:

Under the Mineral Leasing Act (MLA) oil and gas lease sales that are conducted by oral auction in the lower 48. Their process for the MLA sales are much different than for NPR-A. The BLM does not hold MLA lease sales in Alaska at this time.

The NPR-A sales are sealed bid and held under a different authority than the Mineral Leasing Act. BLM issues a "Call for Nominations" with a Federal Register notice. For a sale, the BLM publishes a Federal Register notice announcing the sale.

How would this affect the records you are seeking from the AK State Office?

Information regarding when the State Office conducts lease sales and the process of making logistical arrangements for that lease sale is responsive regardless of the statutory authority under which the lease sale is conducted.

General questions:

Are the requests for “communications and correspondence” about lease sales limited to communications about specific lease sales? (That is: not about lease sales generally.)

That is correct, the focus of the requests is on specific lease sales. That said, general communications about, among other topics, changes to the manner in which lease sales are scheduled, the frequency with which lease sales are conducted, or the process through which lease sales are conducted would be responsive to the FOIA request.

Are all communications, document, drafts, etc. related to Environmental Assessments included in the scope? (Requests for “communications and correspondence” about lease sales; request 3b for “all analyses”). Would the final EA suffice ?

The final EA will suffice to the extent that it contains a comprehensive explanation of why any subset of pending expressions of interest were excluded from a particular lease sale. The inquiry is less about the environmental review or the environmental adequacy of any particular parcel and instead seeks information about how BLM has chosen which parcels will be made available at any particular lease sale.

Narrowed Scope of the request to Eastern States:

The Eastern States FOIA Office indicated that in a conference call you narrowed the request for EOIs to a four-column spreadsheet of EOI information, rather than the EOIs themselves, showing "Operator", "Date", "State", and "Status" for EOIs received after January 1, 2014. To capture pre-2014 EOI statistics, MB agreed to a report showing the number of *all* EOIs, by state. Is this correct? Does this apply to all of the states where you made this request?

The original agreement with Eastern States was made premised upon the understanding that Eastern States would be able to provide the spreadsheet immediately (the Alliance expected to receive that spreadsheet during the week of May 16) and that the Alliance could use the spreadsheet to narrow or refine its requests after reviewing Eastern States’ preliminary response. That spreadsheet was not necessarily a substitute for providing the full scope of material that the Alliance requested, but would have served as a tool to facilitate the gathering of only the most relevant data. This agreement was based on the understanding that Eastern States has jurisdictional responsibility over a wide range of states, many of which have little to no oil and gas activity. Given the amount of time that has passed, the Alliance presumes that Eastern States has used the interim period to collect the full range of information that the Alliance requested initially, and that any spreadsheet provided now will summarize the material requested, not substitute for that material.

Our discussion with the Eastern States office is not applicable to other State offices.

The Eastern States FOIA Office indicated that instead of "all communications", you were seeking "Official Communications." Is this correct? Does this apply to all of the states where you made this request?

We are uncertain what you mean by “official communications.” None of the requests submitted to

any of the State Offices refers to “official communications” or narrows the nature of communications sought. The requests to all offices request *all* communications related to the subjects described in the submissions. It is unclear how any communication in which BLM personnel were engaged related to the subjects listed in the FOIA Requests could be “unofficial.”

Thank you,

Ryan Witt
FOIA Officer
Bureau of Land Management

Direct: (202) 912-7562
Email: rwitt@blm.gov

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From: Spotts, Richard
To: [Kieran Suckling](#); [Rob Mrowka](#); rspivak@biologicaldiversity.org; [Sandy Bahr](#); alicyn.gitlin@sierraclub.org; mark.clemens@sierraclub.org; utah_chapter@sierraclub.org; kim@grandcanyonwildlands.org; [gcwildland](#); [Kelsey Johnson](#); [Susan Crook](#); [Tom Butine](#); janewhalen@earthlink.net; [Arthur Haines](#); utahsmalls@msn.com; [Kathleen Harcksen](#); eyork@tnc.org; lisar@bajabb.com; [Chris Gorzalski](#); friendsofgoldbutte@gmail.com; [Tony Barron](#); michael@glencanyon.org; [Utah Native Plant Society](#); wildutah@xmission.com; [Ed LaRue](#); [Glenn Stewart](#); [Pete Woodman](#); [Kristin Berry](#); [Roger Clark](#); eaumack@grandcanyontrust.org; [Tim Peterson](#); mobrien@grandcanyontrust.org; erickson.steve1@comcast.net; [Carolyn Borg](#); ianderson@biologicaldiversity.org; info@earthjustice.org; [Iris Picat](#); [Sara Vickerman Gage](#); [Northern Jaguar Project](#); [Phil Hanceford](#); nada_culver@tws.org; megan_dickie@tws.org; scott@suwa.org; neal@suwa.org; [Deeda Seed](#); [Greta Anderson](#); admin@sonorandesert.org; sami@skyislandalliance.org; kim@wildlandsnetwork.org
Subject: FYI - Public Lands: Armed conflicts impeded U.S. grazing oversight -- GAO
Date: Friday, July 8, 2016 2:25:27 PM
Attachments: [GAO Unauthorized Grazing Report July 2016.pdf](#)

FYI - If you have not already seen it, you may find the article below of interest. The referenced GAO report is also attached. RS

PUBLIC LANDS:

Armed conflicts impeded U.S. grazing oversight -- GAO

[Phil Taylor](#), E&E reporter

Published: Friday, July 8, 2016

Armed standoffs over federal lands in Nevada and Oregon have impeded the government's ability to enforce grazing laws that protect sensitive soils and stream banks, said a new report from the Government Accountability Office, which also faulted lax oversight.

GAO [found](#) that the Bureau of Land Management and Forest Service have kept poor records of incidents of unauthorized grazing on the 450 million acres they manage in the West and are therefore unable to track potential patterns in violations. As a result, the frequency and extent of unauthorized grazing on federal lands are "largely unknown," GAO found.

BLM and USFS resolve most incidents of unauthorized grazing informally, such as through a phone call or a visit with a rancher, and do not record them in a database, GAO said.

Most unauthorized grazing happens by accident -- such as when livestock stray through an unlatched gate onto lands where they are not permitted to graze, according to data obtained by GAO.

But while there are only a "small number of confrontational ranchers" who refuse to acknowledge the authority of BLM and USFS and who engage in "willful unauthorized grazing," agency staff and conservationists are "concerned that the problem will grow," said the GAO report.

High-profile, armed conflicts over federal grazing restrictions -- including Cliven Bundy's

standoff with BLM in southern Nevada in April 2014 and his son Ammon Bundy's takeover of the Malheur National Wildlife Refuge earlier this year -- have impeded the agencies' ability to manage the range, GAO said.

For example, the Forest Service was prepared to suspend a rancher's permit in Oregon for repeated unauthorized grazing violations but decided not to because of the Malheur takeover, GAO said.

Similarly, Nevada's BLM chief told staff not to visit grazing allotments after Cliven Bundy's 2014 standoff, GAO reported.

The Bunkerville incident followed BLM's decision to impound Bundy's cattle, which had been grazing illegally on federal lands for decades and damaging the range.

Cases of intentional unauthorized grazing and related anti-government protests "can affect agency decision making regarding enforcement" of other grazing infractions, GAO said.

In addition, "lack of support from higher-level managers for strong enforcement action does not incentivize field staff to act on unauthorized grazing and, in some cases, lowers staff morale," the report said.

GAO focused largely on smaller grazing infractions, and BLM and USFS's ability to keep track of them. From 2010 to 2014, the agencies took formal action -- either by billing a penalty for unauthorized grazing or by preparing a law enforcement report -- on nearly 1,500 incidents of unauthorized grazing, the report found.

The agencies said they dealt with most incidents informally and did not record them, a process that is not provided for in the agencies' regulations, GAO said.

"Until the agencies require that all incidents of unauthorized grazing be recorded, including those incidents resolved informally, BLM and the Forest Service will not have a complete record of unauthorized grazing incidents with which to identify any potential pattern of violation," said the report.

"By amending regulations to establish a procedure for the informal resolution of minor infractions, the agencies could achieve the objective of efficiently resolving such incidents with minimal conflict within its regulatory authority," it said.

Reforms underway

In a June 21 letter to GAO, Interior Department Deputy Assistant Secretary for Land and Minerals Management Jim Lyons said the agency agreed with the watchdog's recommendation to either amend its regulations for unauthorized grazing to allow for informal resolutions or to follow existing regulations by sending a formal notice for each potential violation. Lyons said BLM will revise its handbook to "better describe procedures for following the existing regulations."

"As part of this effort, the BLM will clarify the process for documenting and recording incidents of unauthorized grazing, including those resolved informally," Lyons wrote.

USFS spokeswoman Babete Anderson said her agency was "reviewing the [GAO] report and

determining what actions we may need to take."

"So far in our review, we have not found evidence of widespread and repeated unauthorized grazing that the agency was not addressing in some way," she said. "We may learn more to alter as we review the report in more detail."

Both agencies told GAO that informal resolution is the best way to respond to non-willful grazing violations, such as when livestock stray outside their permitted grazing area.

BLM's current grazing regulations describe three levels of unauthorized grazing -- non-willful, willful and repeated willful -- with progressively higher penalties for each level, GAO said. They require BLM to send out a written notice for every potential unauthorized grazing incident.

BLM recorded 859 incidents of unauthorized grazing from 2010 to 2014, and the Forest Service recorded 618 incidents. Of the 466 incidents on BLM lands in which ranchers were billed, roughly two-thirds were for "non-willful" violations.

Out of the nearly 53,000 grazing compliance inspections that BLM performed during those years, about 1,500 -- or 3 percent -- identified possible noncompliance, GAO found.

A majority of the unauthorized grazing is non-willful, involves just a few head of livestock and causes no resource damage, the agencies told GAO.

Yet in some instances, as little as a few weeks of unauthorized grazing can "set back years of progress in restoring riparian areas," said GAO.

"Stakeholders told us that the loss of native grass through unauthorized overgrazing may allow invasive species such as cheatgrass to grow, creating a potential fire hazard, or may result in a loss of habitat for threatened species such as sage grouse," the report said.

"During our field visits," the report said, "we observed locations where unauthorized grazing had resulted in severely damaged natural springs, overgrazed meadows, and trampled streambeds."

Penalties too low

The report also warned that the Forest Service's penalties for unauthorized grazing have been too low to deter violations.

The agency charged \$2.51 per cow and calf per month of unauthorized grazing or less from 2008 to 2014. The penalty shot up to \$10.68 in 2016.

The current charge for authorized grazing on BLM and USFS lands is \$2.11 per head per month, which represents a small portion of the costs of operating a livestock business.

"There are permittees who view the [USFS] penalties for unauthorized grazing as a cost of doing business because paying the penalties is cheaper than seeking forage elsewhere," GAO said.

One USFS employee told GAO that the agency was reluctant to send a bill for penalties for

unauthorized grazing "because it shows how low the penalty is and may encourage additional unauthorized grazing," the report said.

While BLM and USFS collected nearly \$450,000 for unauthorized grazing from 2010 to 2014, all but \$24,000 of that was collected by BLM.

"By adopting an unauthorized grazing penalty structure that is, like BLM's, based on the current price of private forage, the Forest Service's unauthorized grazing penalty can better serve as a deterrent to such grazing," GAO said.

The report reveals a need for greater enforcement of financial penalties for grazing violations and increased data collection on potential serial violators, said House Natural Resources Committee ranking member Raúl Grijalva (D-Ariz.), who requested the report.

"When offenders are detected, BLM frequently exacts no penalties and, for the more serious violations, seldom assesses the minimum penalties its own regulations require," Grijalva said in a statement. "As a result, grazing trespass is not adequately deterred, which can lead to degradation of public rangelands, among other things."

Ethan Lane, executive director of the Public Lands Council, a grazing advocacy organization, noted that the report shows that the "vast majority" of unauthorized grazing happens by accident and is rightfully handled "collaboratively and informally at the local level."

He said, "The vast majority of these don't warrant some sort of formal process."

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July 2016

UNAUTHORIZED GRAZING

Actions Needed to Improve Tracking and Deterrence Efforts

GAO Highlights

Highlights of [GAO-16-559](#), a report to the Committee on Natural Resources, House of Representatives

Why GAO Did This Study

BLM, within the Department of the Interior, and the U.S. Forest Service, within the Department of Agriculture, are responsible for managing most of the nation's public rangelands.

Ranchers must obtain permits or leases from the agencies to graze livestock on federal lands.

Unauthorized grazing may take various forms, such as grazing more livestock than permitted or grazing without a permit.

GAO was asked to examine unauthorized grazing. This report (1) describes what is known about the frequency and extent of unauthorized grazing, and its effects, and (2) examines the agencies' efforts to detect, deter, and resolve unauthorized grazing. GAO analyzed 5 years of the most recent data available on incidents where the agencies had taken formal action on unauthorized grazing (grazing years 2010 through 2014); examined federal laws and agency regulations, policies, and practices; and interviewed by telephone or site visit officials in a nongeneralizable sample of 22 agency field offices in eight western states where most unauthorized grazing had occurred.

What GAO Recommends

GAO is making six recommendations, including that the agencies take actions to record all incidents of unauthorized grazing, that they amend regulations to reflect their practices for resolving such incidents or comply with their regulations, and that the Forest Service revise its unauthorized grazing penalty structure. The agencies generally agreed with GAO's findings and recommendations.

View [GAO-16-559](#). For more information, contact Anne-Marie Fennell at (202) 512-3841 or fennella@gao.gov.

July 2016

UNAUTHORIZED GRAZING

Actions Needed to Improve Tracking and Deterrence Efforts

What GAO Found

The frequency and extent of unauthorized grazing on Bureau of Land Management (BLM) and U.S. Forest Service lands are largely unknown because according to agency officials, the agencies prefer to handle most incidents informally (e.g., with a telephone call) and do not record them. The agencies' databases contained information on nearly 1,500 incidents of unauthorized grazing where formal action was taken by the agencies' range program or law enforcement staff for grazing years 2010 through 2014 (March 1 to February 28). Unauthorized grazing incidents were recorded in the agencies' databases when the agencies billed a penalty for unauthorized grazing or prepared a law enforcement report. However, agency staff told GAO that they handle most incidents informally—their preferred practice—and do not record them in databases or consistently in paper files, because, in part, they do not consider it a priority. As a result, the agencies have incomplete information on the extent of unauthorized grazing. Federal internal control standards call for clear documentation of all transactions and other significant events. Until the agencies require that all incidents of unauthorized grazing be recorded, including those incidents resolved informally, BLM and the Forest Service will not have a complete record of unauthorized grazing incidents with which to identify any potential pattern of violations.

GAO found that the agencies' preferred practice of informally resolving unauthorized grazing is not provided for under agency regulations. Specifically, the regulations do not provide the flexibility to resolve incidents informally without a written notice of violation (in the case of BLM) and without charging unauthorized grazing penalties (in the case of the Forest Service). Most agency staff told GAO that informal resolution is the most effective way to resolve non-willful unauthorized grazing (e.g., when livestock stray outside of their permitted area and graze in an unauthorized area). As discussed in federal internal control standards, program operations are effective and efficient in achieving agency objectives when they produce the intended results and minimize the waste of resources. By amending regulations to establish a procedure for the informal resolution of minor infractions, the agencies could achieve the objective of efficiently resolving such incidents with minimal conflict within its regulatory authority. Alternatively, rather than amending their existing regulations to match their practices, the agencies' could change their practices to comply with their existing regulations. In addition, BLM and the Forest Service undertake similar efforts to detect and deter unauthorized grazing, such as conducting compliance inspections and assessing penalties for unauthorized grazing, but agency staff said that such efforts have limited effectiveness. For example, most of the Forest Service staff GAO interviewed said that unauthorized grazing penalties are too low to act as an effective deterrent. Under current policy, the Forest Services' unauthorized grazing penalty formula calculated a negative number or a number less than the permitted grazing fee for grazing years 2009 through 2012. By adopting an unauthorized grazing penalty structure that is, like BLM's, based on the current price of private forage, the Forest Service's unauthorized grazing penalty can better serve as a deterrent to such grazing.

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Abbreviations

AUM	animal unit month
BLM	Bureau of Land Management

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July 7, 2016

The Honorable Rob Bishop
Chairman
The Honorable Raúl Grijalva
Ranking Member
Committee on Natural Resources
House of Representatives

Since the early 1900s, the federal government has required ranchers to pay a fee for grazing their livestock on millions of acres of federal land, primarily in western states. These ranchers must obtain permits or leases from the responsible federal agencies to graze livestock on federal lands, and must comply with the conditions of these permits or leases, such as grazing their livestock in the permitted numbers and locations, to help protect and preserve the range for multiple uses, such as sustainable grazing. Unauthorized grazing may take several forms, such as grazing during unauthorized times of the year, grazing more livestock than allowed by permit, or grazing outside of permitted areas or in areas closed to livestock. Such unauthorized grazing may be unintentional, such as when livestock stray outside of their permitted area through a broken fence and graze in an unauthorized area. In some cases unauthorized grazing is intentional, such as when ranchers purposely overstay their permitted grazing period or ranchers without permits purposely allow their livestock onto federal lands. Several recent high-profile incidents of intentional unauthorized grazing, including confrontations between ranchers and federal officials, have drawn attention to the extent and effects of unauthorized grazing.

The Bureau of Land Management (BLM), within the Department of the Interior, and the U.S. Forest Service, within the Department of Agriculture, are responsible for managing most of the nation's public rangelands. Under the Taylor Grazing Act of 1934 for BLM and, among other statutes, the Organic Act of 1897 for the Forest Service, livestock grazing became a regulated activity.¹ Both agencies administer grazing programs that allow ranchers to obtain permits, leases, or other permissions to graze

¹See 43 U.S.C. § 315 and 16 U.S.C. § 551.

their livestock on federal lands. BLM has the larger grazing program, administering about 17,600 grazing permits on 153 million acres in grazing year 2015; the Forest Service administered about 6,200 grazing permits on 102 million acres in grazing year 2015.² As the administrators of their grazing programs, the agencies are responsible for detecting and deterring unauthorized grazing. In response to unauthorized grazing, the agencies' staff may impose penalties against permittees and modify or cancel grazing permits.³ In addition, the agencies' law enforcement officers may cite permittees or nonpermittees for violations that subject them to criminal penalties for unauthorized grazing.

In December 1990, we reported on BLM's efforts to detect and deter unauthorized livestock grazing on public rangelands.⁴ We found that because many grazing areas were inspected infrequently or not at all during the year, offenders were not likely to be detected. When offenders were detected, BLM frequently exacted no penalties and, for the more serious violations, seldom assessed the minimum penalties its own regulations required. As a result, unauthorized grazing was not adequately deterred, which could lead to degradation of public rangelands, among other things. In our December 1990 report, we made five recommendations to improve BLM's ability to prevent unauthorized grazing. BLM agreed with the recommendations and implemented one of the five. The agency took steps toward implementing some of the others, but did not fully implement the remaining four recommendations.

You asked us to update our December 1990 report and review BLM's and the Forest Service's efforts to address unauthorized grazing. This report (1) describes what is known about the frequency and extent of unauthorized grazing, and its effects, and (2) examines the agencies' efforts to detect, deter, and resolve unauthorized grazing.

²A grazing year for billing purposes is March 1 to February 28 of the following calendar year. For example, grazing year 2016 covers the period of time from March 1, 2016, to February 28, 2017.

³For the purposes of this report, we use "penalties for unauthorized grazing" to describe the monetary settlement costs based on usage rates applied by the agencies.

⁴GAO, *Rangeland Management: BLM Efforts to Prevent Unauthorized Livestock Grazing Need Strengthening*, [GAO/RCED-91-17](#) (Washington, D.C.: Dec. 7, 1990). This December 1990 report focused solely on BLM; grazing on Forest Service lands was not covered in the report.

To describe what is known about the frequency and extent of unauthorized grazing, we analyzed the agencies' unauthorized grazing data, and to describe the effects of such grazing, we reviewed documentation, interviewed agency officials and stakeholder group representatives, and conducted site visits at agency field office locations. Specifically, we collected data from BLM's and the Forest Service's range management, financial, and law enforcement databases on the frequency and extent of unauthorized grazing for grazing years 2010 through 2014, the most recent and complete data available at the time of our review. We assessed the data provided by the agencies based on our review of database system documentation and discussions with agency database stewards and found the data to be sufficiently reliable for our purposes. We conducted in-person or telephone interviews with staff at 22 of the 218 agency field office locations in eight western states: California, Colorado, Idaho, Nevada, New Mexico, Oregon, Utah, and Wyoming. We selected the 22 offices (13 BLM and 9 Forest Service offices) from among the agency field offices that had the highest numbers of unauthorized grazing incidents or that had been recommended by stakeholders. Of the 22 offices, we conducted site visits at 6 offices in Nevada and Wyoming to interview agency range management and law enforcement staff about the agencies' policies and practices for addressing unauthorized grazing, as well as to review paper case files and observe the effects of unauthorized grazing on federal lands. We conducted telephone interviews with staff in the remaining 16 of the 22 BLM and Forest Service field offices. Our interview results are not generalizable to all agency field office locations and grazing lands and instead are illustrative cases of the office locations reporting the highest number of unauthorized grazing incidents. We also interviewed representatives from 11 stakeholder groups, selected based on their interest in grazing issues.⁵

To examine the agencies' efforts to detect, deter, and resolve unauthorized grazing, we analyzed federal laws to identify agency requirements for addressing unauthorized grazing, as well as the agencies' regulations, policies, and practices. We qualitatively analyzed information obtained in agency and stakeholder interviews for common themes and patterns to describe how the agencies address unauthorized

⁵The stakeholders we interviewed primarily represented cattlemen's associations and rangeland, wild horse, and federal employee advocate groups.

grazing and the effectiveness of their efforts. We compared the agencies' policies to their practices in the field, compared the policies' objectives with their outcomes, and assessed the internal controls for the policies and practices. See appendix I for a more detailed description of our objectives, scope, and methodology.

We conducted this performance audit from May 2015 to July 2016 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

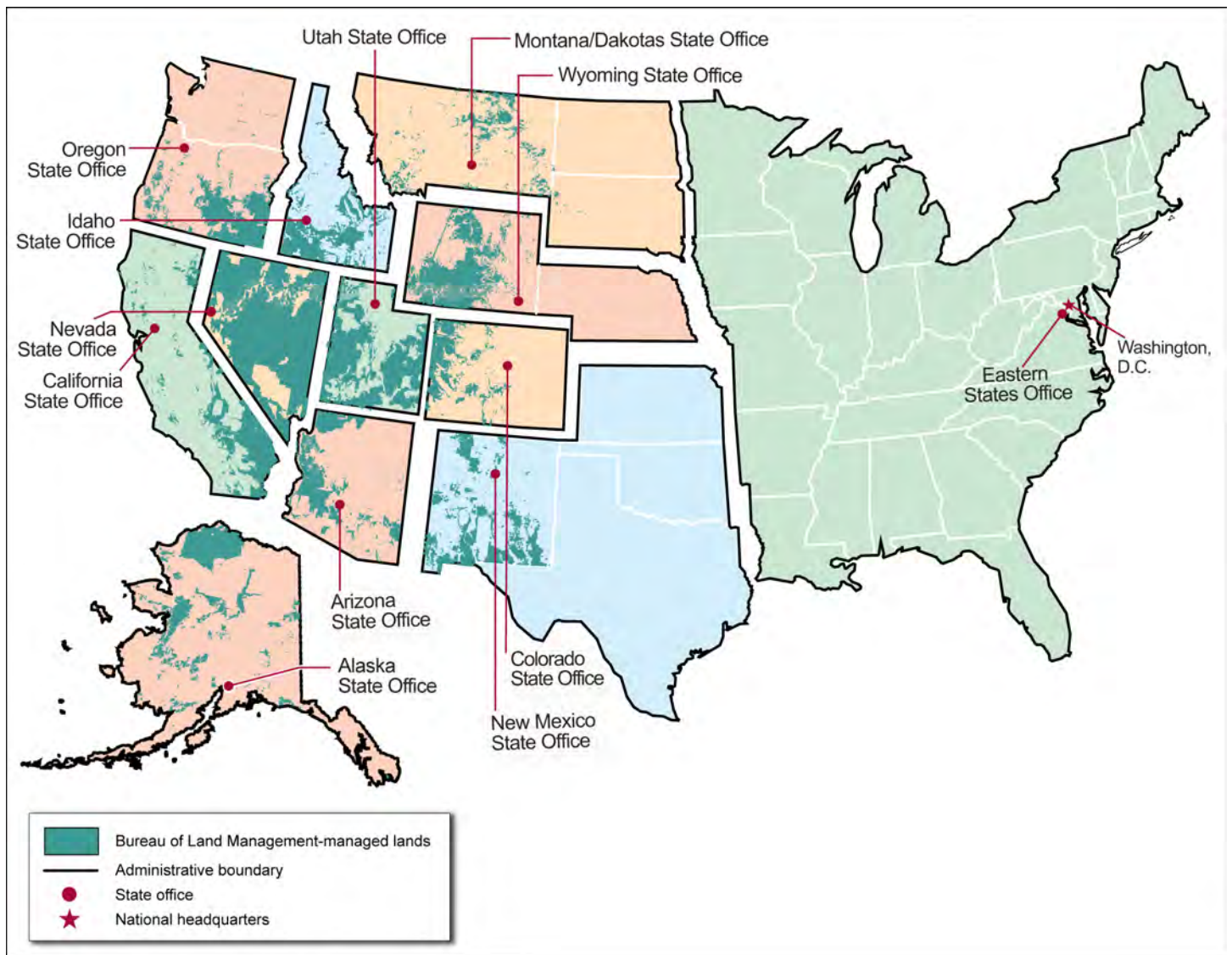
Background

The federal government manages about 640 million acres of land in the United States, including lands in national forests, grasslands, parks, refuges, reservoirs, and military bases and installations. Of the total federal lands, BLM and the Forest Service manage about 450 million acres for multiple uses, including grazing,⁶ timber harvest, recreation, minerals, water supply and quality, and wildlife habitat. BLM's 12 state offices manage nearly 250 million acres in 12 western states, and the Forest Service's 9 regional offices manage more than 190 million acres across the nation (see figs. 1 and 2).⁷ The majority of federal lands are located in the western half of the country.

⁶As we noted in September 2005, 10 federal agencies have programs to allow private ranchers to graze livestock on portions of the lands they manage: the Department of the Interior's BLM, National Park Service, U.S. Fish and Wildlife Service, and Bureau of Reclamation; the Department of Agriculture's U.S. Forest Service; the Department of Energy; and the Department of Defense's Army, Army Corps of Engineers, Air Force, and Navy. See GAO, *Livestock Grazing: Federal Expenditures and Receipts Vary, Depending on the Agency and the Purpose of the Fee Charged*, [GAO-05-869](#) (Washington, D.C.: Sept. 30, 2005). The report reviewed all 10 federal agencies that manage grazing; BLM and the Forest Service managed 98 percent of federal land used for grazing.

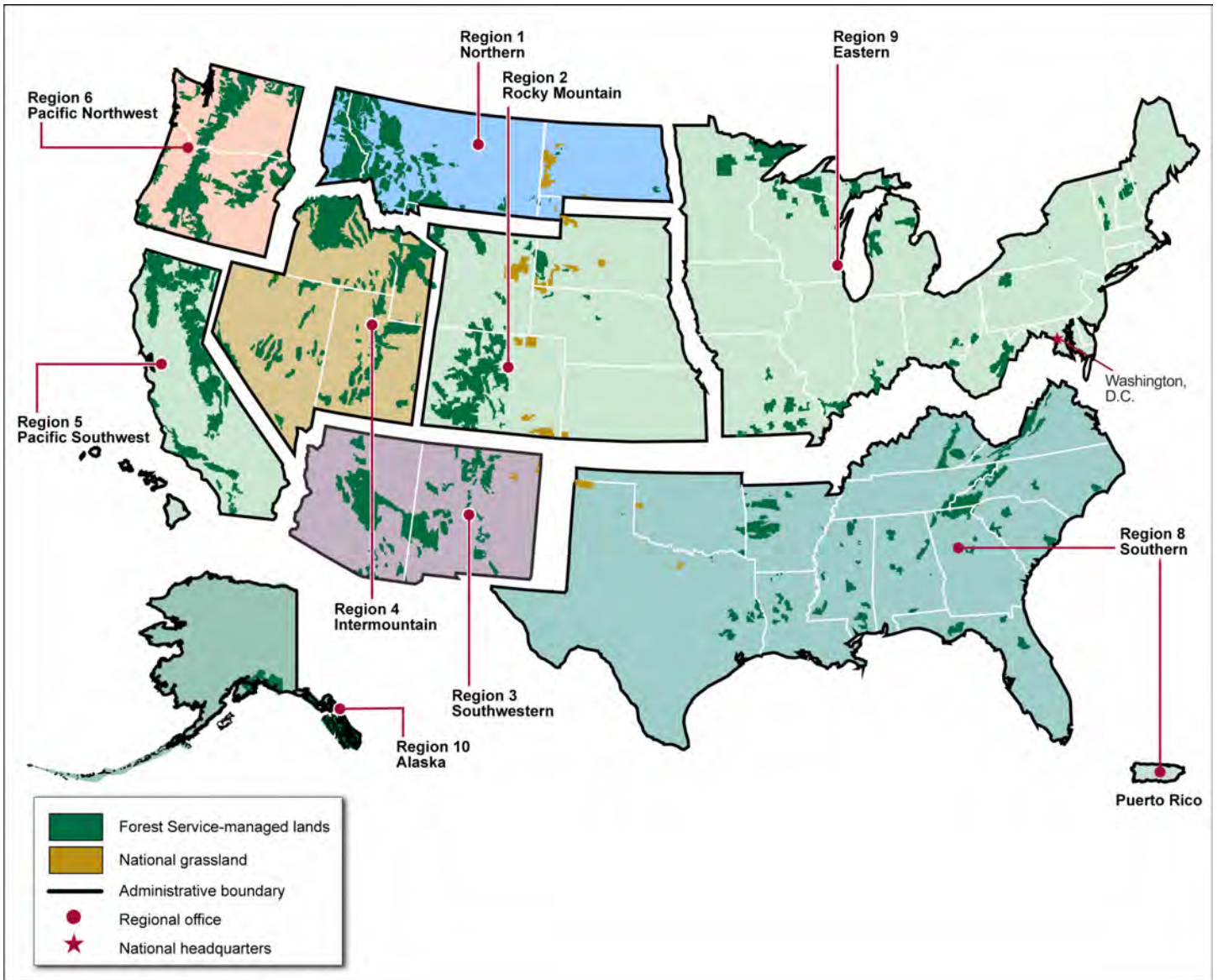
⁷Generally, there are 17 states, including the Great Plains states, considered to be western: Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, New Mexico, Nevada, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming. However, depending on the situation, western states can be grouped and counted differently. Each of BLM's state offices and Forest Service's regional offices has field office locations.

Figure 1: Bureau of Land Management State Offices and Their Administrative Jurisdictions



Source: Bureau of Land Management. | GAO-16-559

Figure 2: U.S. Forest Service Regions and Their Administrative Jurisdictions



Source: U.S. Forest Service. | GAO-16-559

Note: The Forest Service has no Region 7.

The federal government has managed grazing on federal lands for more than 100 years. Following the passage of the Taylor Grazing Act of 1934, the Department of the Interior created the Division of Grazing, later renamed the Grazing Service, to administer provisions of the act. Subsequently, the Grazing Service was merged with the General Land Office to form BLM. The act was passed to stop degradation of public lands caused by overgrazing and soil deterioration; to provide for the orderly use, improvement, and development of public lands; and other purposes. The act also provided for the issuance of permits and leases for these lands and set requirements for the distribution of funds received from grazing. The Forest Service managed grazing under its general authorities until 1950, when Congress enacted the Granger-Thye Act, specifically authorizing the Secretary of Agriculture to issue grazing permits on national forest lands and other lands under the department's administration. Additional laws affecting grazing on both BLM and western Forest Service lands were enacted in the 1970s.⁸

BLM's and the Forest Service's range grazing programs administer livestock grazing for permittees.⁹ Agency law enforcement assists when necessary—primarily to address grazing violations by nonpermittees that cannot be handled administratively. To provide access to grazing, the agencies divide their rangelands into allotments, which can vary in size from a few acres to hundreds of thousands of acres. Because of the land ownership patterns that occurred when the lands were settled, the allotments can be adjacent to private lands or intermingled with private lands. Under its authorities, BLM issues permits for grazing in allotments within its grazing districts and leases for grazing on BLM-administered lands outside grazing districts. To be eligible for a permit or lease on one of BLM's allotments, ranchers, among other things, are required to own or control land or water, called a base property, to which preference for

⁸For example, the Federal Land Policy and Management Act of 1976 limited the length of permits and leases to 10 years and allowed shorter terms, authorized terms, and conditions to be placed on a permit or lease and allowed seasonal limits on grazing. Pub. L. No. 94-579, § 402, 90 Stat. 2743, 2773. The Public Rangelands Improvement Act of 1978 required BLM and the Forest Service to inventory their lands in western states. Pub. L. No. 95-514, § 4, 92 Stat. 1803, 1804.

⁹BLM primarily manages grazing in 11 western states: Arizona, California, Colorado, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, Washington, and Wyoming. The Forest Service manages grazing on forests in 16 western states, eastern states (including Texas), and the national grasslands.

obtaining a permit or lease is attached. The Forest Service, which does not have grazing districts, uses permits to authorize grazing in its allotments.¹⁰ To be eligible for a permit under Forest Service policy, ranchers, among other things, must own base property and the livestock to be permitted. The agencies' permits and leases specify the number and type of livestock allowed on the allotments, the time and duration of use for grazing, and special conditions or use restrictions. Agency field office staff conduct compliance inspections to help ensure that permittees are meeting the terms and conditions of their permits or leases.¹¹ The agencies may modify permits or leases if range conditions are being degraded or suspend or cancel them if permit conditions are violated.

With a few minor exceptions, permittees pay a grazing fee for the use of the federal land. The grazing fee BLM and the Forest Service charge in western states is based on a formula that was originally established by law to prevent economic disruption and harm to the western livestock industry, among other things. The formula expired after 7 years but was extended indefinitely by Executive Order 12,548 and has been incorporated into the agencies' regulations.¹² The fee derived from the formula is generally lower than the fees charged by other agencies, states, and private ranchers. In grazing year 2016, BLM charged ranchers \$2.11 per animal unit month for horses/cattle and \$0.42 for sheep and goats; the Forest Service charged the same rates per head month.¹³ According to the National Agricultural Statistics Service, based on the average private grazing land lease rate per animal unit month, the commercial value of forage in western states ranged from \$9 to \$39 in grazing year 2016. As we found in September 2005, the total grazing fees generated by federal agencies amounted to less than one-sixth of the

¹⁰The Forest Service refers to these as term permits.

¹¹To conduct compliance inspections, field staff visit grazing allotments and check whether the proper number of livestock are in the correct locations. According to agency field staff we interviewed, such inspections may occur randomly; at designated times before, during, or after the grazing season; or in response to reports of potential permit violations.

¹²The Public Rangelands Improvement Act of 1978, Pub. L. No. 95-514, 92 Stat. 1803, and Exec. Order No. 12,548, 51 Fed. Reg. 5985 (Feb. 14, 1986).

¹³Treated as equivalent measures for fee purposes, BLM's animal unit month and the Forest Service's head month refer to the amount of forage a cow and her calf, one horse, or five sheep eat in a month.

agencies' expenditures to manage grazing in 2004.¹⁴ We found that BLM and the Forest Service use most of the grazing fee receipts for range protection and improvements and deposit some receipts to the Department of the Treasury's general fund, with some receipts distributed to states and counties. See appendix II for additional information on grazing, permits, and fees for BLM and the Forest Service.

Unauthorized grazing includes instances in which livestock owners graze on BLM or Forest Service allotments without a permit or lease, as well as instances in which those with permits or leases violate the terms and conditions of those documents, such as by grazing more livestock than allowed by permit, grazing in areas that are closed to livestock, or grazing during unauthorized times of the year. It may be unintentional (non-willful) on the part of the livestock owner, such as when livestock stray through an unlatched gate into an area where they are not permitted to graze, or it may be intentional (willful or repeated willful) such as when a livestock owner purposefully grazes livestock in a manner that is not allowed by a permit or grazes livestock without obtaining a permit once or multiple times.

Under their applicable regulations, BLM and the Forest Service may address unauthorized grazing by charging permittees penalties for unauthorized grazing; revising their permits; impounding livestock; or taking action that could lead to criminal penalties, most commonly for nonpermittees, as follows:

- BLM's grazing regulations establish three levels of unauthorized grazing—non-willful, willful, and repeated willful—with progressively higher penalties for each level.¹⁵ The regulations require that BLM send out a written notice for every potential unauthorized grazing incident.¹⁶ Under certain circumstances, BLM can approve a

¹⁴[GAO-05-869](#).

¹⁵43 C.F.R. §§ 4150.1(a); 4150.3(a), (b), (c) (2005).

¹⁶43 C.F.R. § 4150.2(a) (2005).

nonmonetary settlement for non-willful unauthorized grazing.¹⁷ For willful and repeated willful incidents, in addition to the monetary penalties—the value of the forage consumed—the regulations specify that the offender shall be charged for any damages to the land and reasonable agency expenses incurred to resolve the violation, and BLM shall suspend or cancel all or portions of the grazing permit for repeated willful incidents. BLM may impound and dispose of livestock if the owner is unknown or the permittee fails to remove the livestock when ordered. BLM also has the authority to cite permittees and nonpermittees for grazing violations that subject them to criminal penalties.¹⁸

- The Forest Service’s grazing regulations require the agency, except in certain circumstances, to determine a grazing use rate for unauthorized grazing.¹⁹ The regulations define unauthorized grazing as (1) livestock not authorized by permit to graze upon the land, (2) an excess number of livestock grazed by permittees, or (3) permitted livestock grazed outside the permitted grazing season or allotment.²⁰ Under the regulations, the Forest Service can cancel or suspend a permit if the permittee does not comply with provisions and requirements in the grazing permit or applicable regulations. The agency can impound and dispose of unauthorized livestock or livestock in excess of those authorized by a grazing permit if they are not removed from the area within the periods prescribed by regulation. The Forest Service also has the authority to cite permittees and

¹⁷Under 43 C.F.R. § 4150.3(a) (2005), BLM may approve nonmonetary settlement of non-willful unauthorized use violations if BLM determines that the unauthorized use occurred through no fault of the rancher, the forage use is insignificant, the public lands have not been damaged, and that nonmonetary settlement is in the best interest of the United States.

¹⁸43 C.F.R. § 4170.2-2 (2005).

¹⁹36 C.F.R. § 222.50(a), (h). The exceptions are in 36 C.F.R. § 222.3(c)(2)(ii)(B) through (G). The exceptions are for uses where the Chief of the Forest Service may issue free permits such as for research purposes and administrative studies and other incidental uses. The exceptions do not apply to unauthorized grazing. All unauthorized grazing on Forest Service lands should be charged a penalty.

²⁰The Forest Service refers to violations by permittees as excess grazing and by nonpermittees as unauthorized grazing. For the purpose of this report, we are referring to all grazing violations by permittees or nonpermittees as unauthorized grazing.

nonpermittees for grazing violations that subject them to criminal penalties.²¹

In our December 1990 report on unauthorized grazing on BLM lands, we found that BLM had no systematic method for detecting unauthorized grazing, and when offenses were detected, penalties were rarely assessed.²² We made five recommendations to improve the effectiveness of the BLM'S unauthorized grazing detection and deterrence efforts:

- Develop an unauthorized grazing detection strategy that will (1) establish detection as a workload measure and a reportable accomplishment for which managers are held accountable, (2) use visits to randomly selected allotments to provide systematic compliance coverage, and (3) target additional follow-up visits for those livestock operators who have a history of repeated violations.
- Either (1) ensure that penalties are assessed for all non-willful unauthorized grazing violations as provided for in BLM regulations or (2) amend BLM regulations to establish a procedure for the informal resolution of non-willful unauthorized grazing violations at the local level.
- Require that all unauthorized grazing incidents—including those now handled informally—be documented and made part of the permanent unauthorized grazing file.
- Ensure that field staff impose the penalties required under BLM regulations for willful and repeated willful unauthorized grazing.
- Develop a management information system to provide timely, reliable, and adequate information on such things as (1) the number of compliance visits conducted, (2) the number and level of violations identified, and (3) how each violation is resolved, including those resolved informally.

BLM agreed with the recommendations and implemented one of the five by developing an unauthorized grazing detection strategy. The agency took steps toward implementing some of the others, but did not fully implement the remaining four recommendations.

²¹36 C.F.R. pt. 261.

²²[GAO/RCED-91-17](#).

The Frequency and Extent of Unauthorized Grazing on Agency Lands Are Largely Unknown, and Its Effects May Include Rangeland Degradation

The frequency and extent of unauthorized grazing on BLM and Forest Service lands are largely unknown because according to agency officials the agencies prefer to handle most incidents informally and do not record them. The agencies' databases contained information on nearly 1,500 incidents of unauthorized grazing where formal action was taken by the agencies' range program or law enforcement field staff for grazing years 2010 through 2014. Unauthorized grazing incidents were recorded in the range management databases when a penalty for unauthorized grazing was billed to a permittee by program staff and in the law enforcement databases when a formal report or notice was entered by a law enforcement officer. However, agency field staff told us that most incidents they identify are handled informally—their preferred practice—and are not recorded in their databases or consistently recorded in paper files. Agency field staff told us that unauthorized grazing can severely degrade the range under certain conditions, such as drought, and also told us of other effects, such as creating conflicts between the agencies' staff, ranchers, and other stakeholders.

Agency Databases Identified Nearly 1,500 Incidents of Unauthorized Grazing Where Formal Action Was Taken from 2010 to 2014

The agencies' databases identified nearly 1,500 incidents of unauthorized grazing where formal action was taken by range program staff or by agency law enforcement officers for grazing years 2010 through 2014; BLM data identified a total of 859 incidents, and Forest Service data identified 618 incidents (see table 1).

Table 1: Number of Unauthorized Grazing Incidents Where Formal Action Was Taken by the Bureau of Land Management and U.S. Forest Service, Grazing Years 2010–2014

Agency	Unauthorized grazing incidents where formal action was taken		Total
	By grazing program staff	By law enforcement staff	
Bureau of Land Management	433	426	859
U.S. Forest Service	190	428	618
Total	623	854	1,477

Source: GAO analysis of Bureau of Land Management and U.S. Forest Service data. | GAO-16-559

Notes: The grazing year used for billing grazing fees is March 1 to February 28.

The Bureau of Land Management's and U.S. Forest Service's rangeland grazing programs administer livestock grazing for permittees. Agency law enforcement assists when necessary—primarily to address grazing violations by nonpermittees that cannot be addressed administratively.

The unauthorized grazing incidents identified in the Bureau of Land Management's range management database represent those incidents that occurred in grazing years 2010 through 2014 and were settled and billed by December 28, 2015. The incidents identified in the U.S. Forest Service's range management database represent all those incidents where a penalty for unauthorized

grazing was billed in grazing years 2010 through 2014. The incidents in the law enforcement databases of both agencies represent incidents where formal documentation, such as an incident report (record of observation), warning notice, or violation notice was prepared and entered by a law enforcement officer. The possibility exists that a limited number of incidents were recorded in both the grazing program and law enforcement databases.

The agencies' grazing program field staff generally handle unauthorized grazing by permittees through their administrative process, and law enforcement officers primarily handle unauthorized grazing by those without permits through warnings or criminal citations. Each agency has separate range management and law enforcement databases. For example, unauthorized grazing is recorded in BLM's range management database when a formal action is taken to send a bill to a permittee for penalties—and in some cases charges for damage to the land or to recoup the administrative expenses of the agency—for incidents of unauthorized grazing.²³ In some cases, BLM may include penalties for more than one incident of unauthorized grazing in one bill. The Forest Service's range management database contains incidents where a formal action was taken to send a bill for penalties for unauthorized grazing incidents. The law enforcement databases of both agencies contain incidents where formal documentation, such as an incident report (record of observation), warning notice, or violation notice was prepared by a law enforcement officer and entered into the database.²⁴ See appendix III for detailed information on the extent and frequency of unauthorized grazing formally reported in the agencies' databases.

²³Incidents that are resolved nonmonetarily are not in the database because no bill is generated. BLM does not maintain a central database of notices of violation sent to permittees.

²⁴The possibility exists that some incidents were recorded in both the range management and law enforcement databases. For example, if a BLM law enforcement officer recorded observations of potential unauthorized grazing in an incident report that is entered in the law enforcement database, and then passed that information to the range program staff for resolution with a permittee, the incident may have been recorded in the program's database when a bill was issued. Based on our analysis, such situations cannot be identified with certainty within the databases, but agency officials told us they are unlikely to occur frequently.

Agencies Report Handling Most Unauthorized Grazing Incidents Informally and Do Not Record Them in Their Databases

The full extent and frequency of unauthorized grazing is unknown because most unauthorized grazing incidents identified by the agencies' range program field staff are handled informally and are not recorded in their databases, according to agency officials. We found that these incidents were inconsistently documented in their paper files.²⁵ The databases do not include incidents that are informally resolved with telephone calls or by visits from the agency program staff to the permittees asking them to remove their livestock from areas where they are not permitted.²⁶ Staff we interviewed from all 22 BLM and Forest Service field offices told us they prefer such informal resolutions, particularly for incidents that appear to be non-willful and involve a few head of livestock with no resource damage. Agency staff said that these types of incidents account for the majority of unauthorized grazing they encounter. According to these field staff, the informal resolution allows them to resolve the problem quickly and remain focused on higher-priority activities, such as preparing environmental analyses, while maintaining collaborative and cooperative relations with permittees, who field staff said are largely compliant with their permits.

Agency field staff from both agencies told us that they maintain paper files for permittees that may contain notes on informally resolved unauthorized grazing incidents that are not included in the databases, or may record a telephone call to a permittee in their telephone log. However, they said that such information is not consistently recorded in the permittee files, in part because they do not consider recording such information a priority. As a result, the agencies do not have complete information on unauthorized grazing and therefore may not have the documentation

²⁵Law enforcement officers we spoke with from both agencies told us that they usually report suspected unauthorized grazing incidents to program staff and issue a warning or citation at program staff's request.

²⁶Agency field staff told us that other incidents that would not be recorded include those referred from the program to law enforcement where no enforcement action is taken and those worked out between permittees with no agency intervention. Incidents that go undetected by the agencies would also not be recorded.

needed to deal with any instances of repeat offenders appropriately.²⁷ Federal internal control standards call for agencies to clearly document all transactions and other significant events in a manner that allows the documentation to be readily available for examination.²⁸ This provides a means to retain organizational knowledge and mitigate the risk of having that knowledge limited to a few personnel, as well as a means to communicate that knowledge as needed to external parties, such as external auditors. Until the agencies require that all incidents of unauthorized grazing be recorded, including those incidents resolved informally, BLM and the Forest Service will not have a complete record of unauthorized grazing incidents for tracking patterns of any potential repeat offenders.

Unauthorized Grazing May Degrade Rangelands under Certain Conditions and Can Cause Conflicts between the Agencies, Ranchers, and Stakeholders, among Other Effects

Unauthorized grazing may create various effects, such as severely degrading rangelands under certain conditions. Joint BLM/Forest Service riparian area management guidance states that compliance monitoring of grazing is critical because just a few weeks of unauthorized grazing can set back years of progress in restoring riparian areas²⁹—such as the narrow bands of green adjoining rivers, streams, or springs. Agency field staff we interviewed from 17 out of the 22 offices told us that under certain circumstances, unauthorized grazing can be more damaging than permitted grazing, such as when livestock are allowed into closed riparian areas during times of low precipitation or drought or graze in pastures

²⁷We recommended to BLM in 1990 that information on unauthorized grazing—including those incidents resolved informally—be documented. The agency agreed with, but has not implemented, the recommendation. We also recommended that BLM develop a management information system to provide timely, reliable, and adequate information on such things as (1) the number of compliance visits conducted; (2) the number and level of violations identified; and (3) how each violation is resolved, including those resolved informally. BLM developed the management information system but does not track unauthorized grazing incidents that are resolved informally in the system.

²⁸GAO, *Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#) (Washington, D.C.: November 1999). GAO has revised and reissued *Standards for Internal Control in the Federal Government*, with the new revision effective as of October 1, 2015. GAO, *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: September 2014).

²⁹Bureau of Land Management and U.S. Forest Service, *Riparian Area Management: Grazing Management for Riparian-Wetland Areas*, Technical Reference TR-1737-14 (1997).

earlier than permitted in the spring when grass is first sprouting. Stakeholders told us that the loss of native grass through unauthorized overgrazing may allow invasive species such as cheatgrass to grow, creating a potential fire hazard, or may result in a loss of habitat for threatened species such as sage grouse. During our field visits, we observed locations where unauthorized grazing had resulted in severely damaged natural springs, overgrazed meadows, and trampled streambeds. Agency field staff provided photographs showing unauthorized grazing in protected habitat areas and the effects of overgrazing from unauthorized use (see figs. 3, 4, and 5).

Figure 3: Unauthorized Grazing on Protected Habitat in New Mexico, 2015



Source: U.S. Forest Service. | GAO-16-559

Agency staff told us that they detected cattle grazing on a U.S. Forest Service-designated habitat for the protected New Mexico meadow jumping mouse. The U.S. Fish and Wildlife Service has designated the New Mexico meadow jumping mouse as endangered under the Endangered Species Act.

Figure 4: Unauthorized Grazing on Protected Habitat and Overgrazed Vegetation in New Mexico, 2015



Source: U.S. Forest Service. | GAO-16-559

The cattle in the background are grazing on New Mexico meadow jumping mouse proposed critical habitat. Agency staff told us that the fenced area in the foreground shows how severely the vegetation has been grazed outside of the enclosure. The U.S. Fish and Wildlife Service has designated the New Mexico meadow jumping mouse as endangered under the Endangered Species Act.

Figure 5: Before and After Unauthorized Grazing on a Riparian Area, Oregon, 2015



Source: U.S. Forest Service. | GAO-16-559

According to U.S. Forest Service staff, permitted livestock were to be off the pasture in July 2015, when the before picture was taken. The agency staff documented about 12 pairs of livestock still on the pasture in October 2015. According to the staff, the after picture depicts the effects of a small number of livestock left on a pasture after the authorized date.

Agency staff and stakeholders told us that unauthorized grazing can strain relationships and cause conflicts among various groups. Various stakeholders, such as range protection advocates and others, told us that they often observe unauthorized livestock grazing on the agencies' allotments in the course of their resource monitoring or other activities and notify agency field staff. They are frustrated when it appears that the agencies do not take action. Agency staff we interviewed from 15 out of the 22 field offices told us that they are not always able to confirm and take action on such reporting because it is not timely or lacks specificity, and many staff said that following up to confirm such reports takes them away from higher-priority responsibilities. Agency staff also told us that permittees get frustrated if they do not take prompt action to stop unauthorized grazing by others, such as nonpermittees, which can also lead to conflicts among ranchers, for example, if a nonpermittee's stray livestock consume the forage on a permittee's allotment through unauthorized grazing. According to a wild horse advocate we interviewed, the advocate had experienced threats from ranchers engaged in unauthorized grazing on the range while the advocate was working with BLM to protect and manage the horses.

Agency field staff and stakeholders told us there are only a small number of confrontational ranchers who do not recognize the agencies' authority to manage the range and engage in willful unauthorized grazing, but they are concerned that the problem will grow. Agency field staff we interviewed from 5 out of the 22 field offices told us that high-profile cases of intentional unauthorized grazing and related antigovernment protests can affect agency decision making regarding enforcement, and staff at 4 out of the 22 field offices told us that not taking enforcement action on violators is likely to encourage more unauthorized grazing. For example, staff at one Forest Service office in Oregon told us that they were prepared to suspend a rancher's permit for repeated unauthorized grazing violations but decided not to because of the standoff by antigovernment activists at Malheur National Wildlife Refuge. Agency staff we interviewed from 6 of the 22 field offices told us that lack of support from higher-level managers for strong enforcement action does not incentivize field staff to act on unauthorized grazing and, in some cases, lowers staff morale. The leaders of two stakeholder groups, Western Watersheds Project and Public Employees for Environmental Responsibility, jointly wrote a letter to the Secretary of the Interior in 2015 to express concern about the lack of effective range management of BLM lands in Nevada because of what they characterized as higher-level pressure on local managers to accept ranchers' demands when settling unauthorized grazing incidents; agency staff from three of the local offices we spoke with shared this concern.³⁰ BLM responded to the stakeholders' letter on behalf of the Secretary, stating that the agency is committed to collaborating with permittees to resolve problems that reflect the interests of affected communities while also ensuring that public lands are managed and conserved for the future.

Agency field staff we interviewed from 14 out of the 22 offices told us they generally do not have safety concerns while performing their duties, or did not mention any such concerns, even with the potential for confrontational tactics by some ranchers. BLM and Forest Service law enforcement officials told us that the overall trend for assaults and threats to agency staff had been down in recent years, but they do not track assaults and threats specifically related to grazing incidents. However, BLM field staff

³⁰Letter from Western Watersheds Project and Public Employees for Environmental Responsibility to the Secretary of the Department of the Interior, June 10, 2015.

in Southern Nevada were directed by the state office not to visit grazing allotments after an armed standoff with a rancher over the agency's impoundment of his cattle for unauthorized grazing. At one BLM field office we visited in Northern Nevada, there was a protest site established across the street in response to the office's efforts to enforce unauthorized grazing regulations (see fig. 6). Field staff told us that as a result of a statewide BLM assessment, the office upgraded its security to include video cameras, card key locks, and entrance barricades.

Figure 6: Protest Site at Bureau of Land Management Office, Nevada, 2015



Source: Bureau of Land Management (BLM). | GAO-16-559

This site across the street from the BLM field office is used, according to agency staff, to protest BLM's efforts to impose penalties for unauthorized grazing.

Finally, unauthorized grazing that is not detected or not formally acted on when identified cannot be billed penalties for unauthorized grazing, resulting in forgone revenues. The agencies track penalties for unauthorized grazing billed and collected but do not track those forgone. Based on information from the agencies' databases, BLM and the Forest Service collected nearly \$450,000 for unauthorized grazing in grazing years 2010 through 2014. BLM collected about \$426,000 and has a balance due of about \$8,000 for unauthorized grazing during that time frame. The Forest Service collected about \$24,000 and reported no balance due for the same time frame.

Agencies' Efforts to Detect, Deter, and Resolve Unauthorized Grazing Have Shortcomings That Limit Their Effectiveness

BLM and the Forest Service undertake similar efforts to detect and deter unauthorized grazing, such as conducting compliance inspections on grazing allotments and charging penalties for unauthorized grazing, but agency field staff told us that such efforts have limited effectiveness for various reasons. While it is the preferred practice of agency field staff to resolve incidental unauthorized grazing informally, BLM and Forest Service regulations do not provide agency staff with the flexibility to resolve incidents informally with no written notice of violation and no penalty for unauthorized grazing charged.

BLM and the Forest Service Have Similar Detection and Deterrence Efforts, but Effectiveness Is Limited for Various Reasons

BLM and the Forest Service have undertaken a number of similar efforts to detect and deter unauthorized grazing. These include conducting compliance inspections, charging penalties for unauthorized grazing, issuing willful and repeated willful violations, modifying permits, and issuing criminal citations. However, BLM and Forest Service field staff we spoke with said that these efforts can have limited effectiveness in practice for various reasons, such as field staff being unavailable to conduct compliance inspections because of other priorities or the penalty for unauthorized grazing being lower than the current commercial value of forage.

Compliance Inspections

Field staff from both agencies told us that conducting compliance inspections is one of their more effective efforts for detecting and deterring unauthorized grazing. Specifically, staff we interviewed from 16 of the 22 agency offices said that compliance inspections are always or usually effective in detecting unauthorized grazing, and staff from 13 of the 22 said that such inspections are always or usually an effective deterrent. However, field office staff we spoke with told us that they have a limited number of knowledgeable staff—in part because of significant staff turnover, including transfers and retirements—administering vast acres of rangeland, and growing workloads that require multitasking and spending significant time in the office. In addition, grazing allotments are often in remote locations that can take hours to access by vehicle, horseback, or hiking. As a result, they said that compliance inspections are not a top priority and some allotments are seldom visited, which may diminish inspections' deterrent effect. The number of field range staff available to conduct compliance inspections declined for both agencies

Penalties for Unauthorized
Grazing

from 2010 to 2014—from 1,829 to 1,795 for BLM and from 443 to 399 for the Forest Service.³¹ On average, each BLM range staff member is responsible for approximately 85,000 acres, and each Forest Service range staff member is responsible for approximately 255,000 acres. At one BLM field office in Utah, field staff told us that 2 range staff are responsible for 2 million acres and that competing work priorities often keep these staff in the office rather than out in the field. Many field staff said they focus inspections on areas with a history of compliance issues but that some unauthorized grazing likely goes undetected.

Agency field staff—primarily those from the Forest Service—told us that penalties for unauthorized grazing are too low under current agency policy to act as an effective deterrent. Field staff we interviewed from 6 out of the 9 Forest Service offices and 4 out of the 13 BLM offices said that penalties for unauthorized grazing are rarely or never an effective deterrent. As a result, some told us that there are permittees who view the penalties for unauthorized grazing as a cost of doing business because paying the penalties is cheaper than seeking forage elsewhere. For example, Forest Service staff at one field location told us that they are reluctant to send a bill for penalties for unauthorized grazing because it shows how low the penalty is and may encourage additional unauthorized grazing.

We found that for grazing years 2008 through 2014, the Forest Service penalty for unauthorized grazing was \$2.51 or less per head month, which was substantially less than BLM's penalty for unauthorized grazing. The Forest Service calculates this penalty using the same formula that it and BLM use each year to calculate the permitted grazing fee. The formula for the permitted fee has a preset base value of \$1.23 and other input values, such as the prices of private forage and beef cattle, which can vary annually. To calculate its penalty for unauthorized grazing using this formula, the Forest Service applies a higher preset base value of \$3.80 rather than \$1.23. (For more detailed information on the formula and calculation, see app. II.) For grazing years 2009 through 2012, the Forest Service's unauthorized grazing penalty formula calculation would have resulted in a negative number or a number lower than the permitted

³¹BLM provided data on staff at the end of each fiscal year; the Forest Service provided information on staff as of January 31 of each year.

grazing fee. To address this situation, a Forest Service official told us that the agency decided to hold the penalty for unauthorized grazing at \$2.24 per head month until the formula calculation resulted in a higher penalty. In contrast, as shown in table 2, the BLM penalty for non-willful unauthorized grazing—based on commercial forage rates in each state—ranged from \$8 to \$33.50 per animal unit month for grazing years 2008 through 2014, and BLM doubled the penalty for willful incidents and tripled it for repeated willful incidents. In addition, with higher-level offenses (willful and repeated willful), BLM regulations require unauthorized grazing bills to also include “all reasonable expenses incurred by the United States in detecting, investigating, resolving violations, and livestock impoundment costs.”³²

Table 2: Bureau of Land Management’s and U.S. Forest Service’s Permitted Grazing Fee and Unauthorized Grazing Penalties, Grazing Years 2001–2016

Grazing year ^a	Permitted grazing fee ^b	U.S. Forest Service penalty for unauthorized grazing ^c	Bureau of Land Management penalty for unauthorized grazing		
			Non-willful penalty ^d	Willful penalty ^d	Repeated willful penalty ^d
2001	\$1.35	\$3.34	\$7.00 – \$20.00	\$14.00 – \$40.00	\$21.00 – \$60.00
2002	1.43	4.41	7.00 – 20.60	14.00 – 41.20	21.00 – 61.80
2003	1.35	3.80	7.50 – 22.00	15.00 – 44.00	22.50 – 66.00
2004	1.43	4.41	7.00 – 21.60	14.00 – 43.20	21.00 – 64.80
2005	1.79	6.12	8.00 – 23.00	16.00 – 46.00	24.00 – 69.00
2006	1.56	4.83	8.00 – 22.50	16.00 – 45.00	24.00 – 67.50
2007	1.35	4.10	8.00 – 24.00	16.00 – 48.00	24.00 – 72.00
2008	1.35	2.24	8.00 – 23.00	16.00 – 46.00	24.00 – 69.00
2009	1.35	2.24	8.50 – 25.00	17.00 – 50.00	25.50 – 75.00
2010	1.35	2.24	8.33 – 24.80	16.66 – 49.60	24.99 – 74.40
2011	1.35	2.24	9.00 – 25.60	18.00 – 51.20	27.00 – 76.80
2012	1.35	2.24	9.00 – 27.30	18.00 – 54.60	27.00 – 81.90
2013	1.35	2.51	9.00 – 28.50	18.00 – 57.00	27.00 – 85.50
2014	1.35	2.31	9.00 – 33.50	18.00 – 67.00	27.00 – 100.50

³²43 C.F.R. § 4150.3 (2005).

Grazing year ^a	Permitted grazing fee ^b	U.S. Forest Service penalty for unauthorized grazing ^c	Bureau of Land Management penalty for unauthorized grazing		
			Non-willful penalty ^d	Willful penalty ^d	Repeated willful penalty ^d
2015	1.69	2.89	9.00 – 38.00	18.00 – 76.00	27.00 – 114.00
2016	2.11	10.68	9.00 – 39.00	18.00 – 78.00	27.00 – 117.00

Source: Bureau of Land Management and U.S. Forest Service data. | GAO-16-559

^aThe grazing year used for billing grazing fees is March 1 to February 28.

^bThe permitted grazing fee is for cattle and horses, and it is based on the formula and constraints in the Public Rangelands Improvement Act of 1978 and Executive Order No. 12,548 (Feb. 14, 1986). For example, under the executive order the grazing fee cannot be less than \$1.35 and it cannot change more than 25 percent of the previous year's fee. BLM charges the rate by animal unit month and Forest Service charges the rate by head month. Treated as equivalent measures for fee purposes, each is the amount of forage needed to support one cow and her calf, one horse, or five sheep for a month.

^cThe Forest Service calculates its penalty for unauthorized grazing using the same formula that is used to calculate the permitted grazing fee, but with a higher base value of \$3.80 as compared with \$1.23. Furthermore, the Forest Service's formula for calculating its penalty for unauthorized grazing does not include a lower limit or a limit on the yearly increase or decrease. In grazing year 2008 the penalty fell to \$2.24 and would have fallen into negative numbers under the formula in subsequent years. To address this situation, Forest Service officials decided to hold the penalty at \$2.24 from 2009 to 2012 until the formula calculated a higher penalty in 2013, \$2.51. In 2015, the Forest Service erroneously applied a limit of 25 percent on the increase of the penalty; the penalty with the limit was \$2.89, while the penalty without an increase limit under the formula would have been \$6.48. The agency did not apply a limit on the increase in 2016 to calculate a penalty of \$10.68.

^dBLM bases its penalty for non-willful unauthorized grazing on a state-by-state commercial value of forage—that is, the average private grazing land lease rate per animal unit month—as determined annually by the National Agricultural Statistics Service. For willful unauthorized grazing, the penalty is doubled; for repeated willful, it is tripled.

Compared to BLM's penalties, the Forest Service penalty for unauthorized grazing is less likely to be a deterrent for unauthorized grazing, and the differing penalty structures result in inconsistency between the two federal agencies. As we noted in March 2003,³³ penalties generally should be designed in such a way as to serve as a deterrent for unauthorized activities. Forest Service regulations incorporate Office of Management and Budget guidance, which directs that a fair market value be obtained for all services and resources

³³GAO, *Civil Penalties: Agencies Unable to Fully Adjust Penalties for Inflation Under Current Law*, GAO-03-409 (Washington, D.C.: Mar. 14, 2003). In this March 2003 report, we concluded that civil monetary penalties are an important element of regulatory enforcement and that suitably severe maximum penalties allow agencies to punish willful and egregious violators appropriately and serve as a deterrent to future violations. In addition, we concluded that civil penalties should be periodically adjusted for the effects of inflation so that they do not lose their relevancy.

provided to the public through establishment of a system of reasonable fee charges.³⁴ By adopting a penalty structure for unauthorized grazing use that is, similar to BLM's, based on the current commercial value of forage (a fair market value), the Forest Service's penalty for unauthorized grazing can better serve as a deterrent to such grazing and be consistent with BLM's penalty.

The Forest Service recognized that its formula for calculating its penalty for unauthorized grazing was problematic in grazing year 2009 when the formula produced a negative value. A Forest Service official told us that the agency is considering options for revising the penalty as part of its ongoing update of grazing guidance, but the update has not been completed because of higher priorities. The Forest Service does not have a time frame for when the penalty for unauthorized grazing will be revised, according to agency officials. Until the Forest Service revises its penalty for unauthorized grazing to reflect current forage rates, similar to BLM's, the penalty has limited value as a deterrent to unauthorized grazing.

Willful and Repeated Willful Violations

BLM field staff generally told us that willful and repeated willful unauthorized grazing incidents are rare; most unauthorized grazing is incidental and non-willful. However, staff we interviewed from 3 of the 13 BLM field offices who had encountered willful and repeated willful unauthorized grazing incidents said that such violations are difficult to support because staff must prove that the unauthorized grazing was the fault of the livestock owner and show that a record of prior willful violations existed for repeat offenses, per agency regulations and policy. As mentioned previously, because BLM staff generally prefer informal resolution for most incidents of unauthorized grazing, there may not be a paper trail documenting repeated incidents. In some offices this was exacerbated by staff turnover. Specifically, field staff we interviewed from 7 of the 22 offices told us that institutional knowledge is lost when staff depart who are familiar with the extent and circumstances of unauthorized grazing that was resolved informally. As a result, BLM staff told us that they generally only pursue willful or repeated willful violations for the most egregious, long-term cases of unauthorized grazing.

³⁴36 C.F.R. § 222.50(b).

Agency regulations also direct BLM staff to collect reasonable agency expenses for resolving willful and repeated willful incidents, but field staff told us that they have discretion in determining what is reasonable and therefore may not charge violators for agency expenses. For example, field staff said that they may agree to waive the expenses if they were insignificant or to make it less likely that the permittee will appeal the decision. Our review of willful and repeated willful unauthorized grazing incidents in BLM's grazing program database from grazing years 2010 through 2014 found that the administrative expenses were billed to violators in 98 out of 164, or 60 percent, of such incidents. We reviewed the paper file documentation for BLM's 24 willful and 3 repeated willful unauthorized grazing cases in grazing year 2014, and found that in most cases field staff had documented how they determined the appropriate penalties and expenses to bill.³⁵

Permit Modifications

Agency staff and cattlemen's association representatives told us that the agencies' policies for modifying permits, such as reducing the number of permitted livestock for an allotment or suspending or canceling the permits, are likely to be the greatest deterrent to unauthorized grazing, in part because they directly affect the permittees' livelihoods. Field staff we interviewed from 18 of the 22 offices said that permit modifications are always or usually an effective deterrent. In practice, field staff from 19 of the 22 said that they generally view this as a last resort penalty and seldom modify, suspend, or cancel permits for unauthorized grazing in part because the warning is usually sufficient to obtain compliance. In one example, Forest Service staff at an office in Nevada said they had canceled only one permit, for a permittee with a particularly long record of persistent unauthorized grazing. Staff said that a warning about the potential for permit action is generally enough to achieve immediate compliance in almost all detected unauthorized grazing cases involving permittees.

Citations

According to agency field staff, misdemeanor criminal citations are primarily issued to nonpermittees for unauthorized grazing and can be an effective deterrent. However, law enforcement officers and program staff

³⁵For the cases where the determination of penalties and expenses was not documented, agency staff told us, for example, that a bill for unauthorized grazing penalties may have been sent based on a verbal agreement with the violator, or the expenses may have been considered minimal and therefore were not documented or included in the bill.

we interviewed from 5 out of the 22 offices told us that federal attorneys may choose not to prosecute citations or the courts may lower the penalties, which may diminish the effectiveness of this deterrent. For example, a Forest Service law enforcement officer in Utah said that circuit courts typically lower penalties to a couple hundred dollars or less, which is below the cost of buying forage elsewhere. Furthermore, law enforcement officers and program staff we interviewed from 7 out of the 22 offices told us that when on patrol the officers are generally focused on higher priorities, such as public safety. In addition, staff from 7 of the 22 offices we interviewed said that the officers usually do not have knowledge of permit conditions and therefore do not know when livestock should or should not be in a certain location.

BLM and Forest Service Regulations Do Not Provide Flexibility for the Agencies' Preferred Practice of Informal Resolution for Unauthorized Grazing

BLM and Forest Service regulations do not provide field staff of both agencies with the flexibility to follow their preferred practice of informally resolving unauthorized grazing incidents with no written notice of violation and no penalty for unauthorized grazing. We recommended in 1990 that BLM either ensure that all penalties are assessed for non-willful unauthorized grazing, as provided for in its regulations, or amend its regulations to establish a procedure for informal resolution.³⁶ The agency amended its regulations to add the option for the nonmonetary resolution of certain non-willful incidents, but the amendment did not remove the requirement for a written notice of violation. Forest Service regulations do not specifically require a written notice of violation but require that a penalty be determined; nonmonetary resolution is not an option.³⁷ As a result, informal resolution with no written notice and no penalty—the preferred practice for field staff in dealing with unauthorized grazing—is not allowed for under either agency's regulations.

³⁶GAO/RCED-91-17.

³⁷The Forest Service issued interim grazing permit suspension and cancellation procedures in October 2001 following the ruling of the United States Court of Appeals for the Ninth Circuit in *Anchustegui v. Department of Agriculture*, 257 F.3d 1124 (9th Cir. 2001). The procedures provided guidance for implementing the court's finding that under the Administrative Procedures Act, the Forest Service is required to give notice in writing of the facts which may warrant action, and must give an opportunity to the permit holder to achieve compliance, when the violation is non-willful. The Forest Service has not revised its regulations or policies to reflect these procedures.

While not provided for under the regulations, most agency field staff told us that informal resolution is the most effective way to achieve the objective of quickly resolving non-willful unauthorized grazing with minimal conflict, and is the most efficient use of their time given multiple higher-priority responsibilities. As discussed in federal internal control standards, program operations are effective and efficient in achieving agency objectives when they produce the intended results and minimize the waste of resources.³⁸ Management is responsible for designing the policies and procedures to fit an entity's circumstances and building them in as an integral part of the entity's operations. BLM and Forest Service officials stated that handling incidental unauthorized grazing informally is necessary and effective because they have limited staff and permittees tend to be largely compliant. However, the agencies have not established in regulations procedures for such informal resolution or alternatively taken steps to ensure that staff comply with existing regulations as written. By amending the regulations to establish procedures for the informal resolution of violations of the grazing regulations at the local level, agency management could achieve the objective of quickly resolving incidental unauthorized grazing with minimal conflict, in a manner consistent with its regulations and with the most efficient use of the agency's resources. Alternatively, rather than amending their existing regulations to match their practices, the agencies could change their practices to comply with their existing regulations. BLM officials told us that the agency has faced challenges in revising its grazing regulations, including the incorporation of our 1990 recommendations; the most recent revision was enjoined by the court from implementation in 2006 after it was challenged by interest groups.³⁹ The Code of Federal Regulations currently contains the enjoined regulations; agency officials plan to replace these regulations with the regulations that were in effect prior to the court's action but have not set a date for completing the process.

Furthermore, BLM has not updated its Unauthorized Grazing Use Handbook since 1987—in part because of the enjoined regulations—and it contains guidance that differs in some cases from the existing regulations. For example, the handbook does not reference the option

³⁸ [GAO/AIMD-00-21.3.1](#).

³⁹ *Western Watersheds Project v. Kraayenbrink*, 538 F. Supp. 2d 1302 (D. Idaho 2008), *aff'd in relevant part* 632 F.3d 472 (9th Cir. 2011), *cert. denied* 132 S.Ct. 366 (2011).

of nonmonetary settlement for certain non-willful unauthorized grazing incidents that is contained in the regulations. In addition, the handbook description of penalties differs from that in the regulations for willful violations—the regulations state that the rate is twice the value of forage consumed, while the handbook states that the rate is three times the value of forage consumed. Furthermore, the regulations state that the value of damages to public lands shall be included in settlement for willful and repeated willful violations, and the handbook states generally that the value of damages “must be charged,” without specifying which violations must incur the charge. As a result, staff using the handbook may not be consistently following the regulations. Federal internal control standards call for agency management to periodically review policies, procedures, and related control activities for continued relevance and effectiveness in achieving the entity’s objectives or addressing related risks.⁴⁰ Without revising the agency’s grazing guidance to make it consistent with the grazing regulations, BLM does not have reasonable assurance that its staff consistently apply the grazing regulations.

Conclusions

BLM and the Forest Service face the daunting task of effectively managing grazing on millions of acres of remote rangeland with a limited number of field staff who have multiple responsibilities and competing priorities. Given the large number of acres and permits managed under the agencies’ programs, the number of unauthorized grazing incidents that are formally reported is relatively small, and the reportedly larger number of incidents that are resolved informally and not recorded in any database or consistently recorded in paper case files are most often considered by agency field staff to be incidental and quickly remedied with minimal impact on range resources. By amending the regulations to establish procedures for the informal resolution of non-willful violations of the grazing regulations at the local level, agency management could achieve the objective of quickly resolving incidental unauthorized grazing with minimal conflict, in a manner consistent with its regulations and with the most efficient use of the agency’s resources. Alternatively, rather than amending their existing regulations to match their practices, the agencies could change their practices to comply with their existing regulations. While it may be reasonable for the agencies to handle incidental

⁴⁰[GAO/AIMD-00-21.3.1](#).

unauthorized grazing informally, given their limited staff and a largely compliant pool of permittees, it is important that each agency's practices accurately reflect its grazing regulations to ensure clarity and consistency in application for staff and permittees.

Furthermore, without recording the incidents of unauthorized grazing that are informally resolved, neither agency has complete information on the extent and frequency of unauthorized grazing for tracking patterns of any potential repeat offenders. In addition, until BLM revises its grazing guidance to make it consistent with the grazing regulations, the agency does not have reasonable assurance that its staff consistently apply the regulations. Finally, until the Forest Service revises its unauthorized grazing penalty structure to reflect the current value of forage, similar to BLM, the deterrent effect of the penalty will be limited, and some ranchers will continue to view the penalty as a cost of doing business.

Recommendations for Executive Action

To improve the effectiveness of BLM's efforts to track and deter unauthorized grazing, we recommend that the Secretary of the Interior direct the Director of BLM to take the following three actions:

- amend the regulations on unauthorized grazing use—43 C.F.R. Subpart 4150 (2005)—to establish a procedure for the informal resolution of violations at the local level, or follow the existing regulations by sending a notice of unauthorized use for each potential violation as provided by 43 C.F.R. § 4150.2(a) (2005);
- record all incidents of unauthorized grazing, including those resolved informally; and
- revise the agency's *Unauthorized Grazing Use Handbook* to make it consistent with 43 C.F.R. pt. 4100 (2005).

To improve the effectiveness of the Forest Service's efforts to track and deter unauthorized grazing, we recommend that the Secretary of Agriculture direct the Chief of the Forest Service to take the following three actions:

- amend the regulations on range management—36 C.F.R. pt. 222—to provide for nonmonetary settlement when the unauthorized or excess grazing is non-willful and incidental, or follow the existing regulations by determining and charging a grazing use penalty for all unauthorized and excess use when it is identified as provided by 36 C.F.R. § 222.50(a) and (h);

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- record all incidents of unauthorized grazing, including those resolved informally; and
 - adopt an unauthorized grazing penalty structure that is based, similar to BLM's, on the current commercial value of forage.

Agency Comments

We provided the Departments of Agriculture and the Interior with a draft of this report for their review and comment. In its written comments, reproduced in appendix IV, the Forest Service generally concurred with our findings and recommendations. In its comments, the Forest Service stated that it has taken preliminary steps toward updating its guidance to field units, including guidance for unauthorized grazing penalties similar to BLM's. In its written comments reproduced in appendix V, the Department of the Interior generally concurred with our findings and recommendations. In its comments, the Department of the Interior stated that it will revise its guidance to better describe procedures for following existing regulations, to provide procedures for documenting and recording all unauthorized grazing incidents, and will ensure that its guidance is consistent with its regulations. The Department of the Interior also provided technical comments that were incorporated, as appropriate.

As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to the appropriate congressional committees, the Secretaries of Agriculture and the Interior, and other interested parties. In addition, the report will be available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff members have any questions about this report, please contact me at (202) 512-3841 or fennella@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Key contributors to this report are listed in appendix VI.



Anne-Marie Fennell
Director, Natural Resources and Environment

Appendix I: Objectives, Scope, and Methodology

Our objectives were to (1) describe what is known about the frequency and extent of unauthorized grazing, and its effects, and (2) examine the Bureau of Land Management's (BLM) and the U.S. Forest Service's efforts to detect, deter, and resolve unauthorized grazing.

To describe the frequency and extent of unauthorized grazing, we analyzed the agencies' unauthorized grazing data, and to describe the effects of such grazing, we reviewed documentation, interviewed agency officials and stakeholder group representatives, and conducted site visits at agency field office locations. We collected data from BLM's and the Forest Service's range management, financial, and law enforcement databases on the frequency and extent of unauthorized grazing for grazing years 2010 through 2014,¹ the most recent and complete data available at the time of our review. We also collected information on grazing acres, usage, and permits, which came from different years depending on what was the most recently available at the time of our request. For BLM, we obtained range management data from its Rangeland Administration System; financial data on unauthorized grazing bills from its Collection and Billing System; and law enforcement data from its Incident Management, Analysis, and Reporting System. For the Forest Service, we obtained range management and billing data from its INFRA system and law enforcement data from its Law Enforcement and Investigations Management Attainment Reporting System.² We assessed the data provided by the agencies based on our review of database system documentation and discussions with agency database stewards and found the data to be sufficiently reliable for our purposes.

We conducted in-person and telephone interviews with staff in 22 of the 218 agency field office locations in eight western states where most such grazing had occurred. We selected the 22 offices from among the agency field offices that had the highest numbers of unauthorized grazing incidents or that had been recommended by stakeholders. From the 22 selected offices, we conducted site visits to 6 offices located in Nevada and Wyoming to interview agency range management and law

¹A grazing year for billing purposes is March 1 to February 28. For example, grazing year 2016 covers the period of time from March 1, 2016, to February 28, 2017.

²INFRA is a database tool for tracking infrastructure within the Forest Service's Natural Resource Manager system.

enforcement staff about the extent of unauthorized grazing and the agencies' policies and practices for addressing it, as well as to review paper case files and observe the effects of unauthorized grazing on federal lands. We also conducted telephone interviews with staff in 16 of the 22 BLM and Forest Service field locations in California, Colorado, Idaho, Nevada, New Mexico, Oregon, and Utah. Our interview results are not generalizable to all agency field office locations and grazing lands and instead are illustrative cases of the office locations reporting the highest numbers of unauthorized grazing incidents. Tables 3 and 4 provide more information about the agency field office locations where we conducted interviews.

To obtain the views of interested stakeholders, we conducted interviews with representatives of 11 stakeholder groups, including telephone interviews with cattlemen's association representatives in California, Colorado, Nevada, New Mexico, and Oregon. We also conducted telephone interviews with representatives of other stakeholders, including Public Employees for Environmental Responsibility, Forest Service Employees for Environmental Ethics, Western Watersheds Project, Wildlands Defense, and others, such as a wild horse advocate. We selected these groups based on information provided by agency officials or other stakeholder groups involved in grazing issues; in one case, we spoke with a stakeholder who contacted us after learning of our review. We qualitatively analyzed agency and stakeholder interviews for common themes and patterns to describe how the agencies address unauthorized grazing and the effectiveness of these policies and practices. We coded interviews using qualitative data analysis software that allows organization and analysis of information from a variety of sources. Our coding process involved one independent coder putting information into initial categories and a second independent coder verifying that initial work. The coders discussed and resolved any discrepancies in coding.

Table 3: Bureau of Land Management Field Offices Where GAO Conducted Interviews from August 2015 through January 2016

Field Office name	State
Fillmore	Utah
Humboldt River	Nevada
Lander	Wyoming
Las Vegas	Nevada
Monticello	Utah
Mount Lewis	Nevada
Rio Puerco	New Mexico
Shoshone	Idaho
Stillwater	Nevada
Surprise	California
Taos	New Mexico
Upper Snake	Idaho
Worland	Wyoming

Source: GAO. | GAO-16-559

Table 4: U.S. Forest Service Field Offices Where GAO Conducted Interviews from August 2015 through January 2016

National Forest name	State
Bridger-Teton	Wyoming
Cibola	New Mexico
Humboldt-Toiyabe	Nevada
Lincoln	New Mexico
Malheur	Oregon
Manti-LaSal	Utah
Santa Fe	New Mexico
Uinta-Wasatch-Cache	Utah
White River	Colorado

Source: GAO. | GAO-16-559

To examine the agencies' efforts to detect, deter, and resolve unauthorized grazing, we analyzed federal laws to identify agency requirements for addressing such grazing as well as the agencies' regulations, policies, and practices. We qualitatively analyzed information obtained in agency and stakeholder interviews for common themes and patterns to describe how the agencies address unauthorized grazing and the effectiveness of their efforts. We compared the agencies' policies to their practices in the field, compared the policies' objectives with their outcomes, and assessed the internal controls for the policies and practices. We also compared the agencies' policies and practices to our recommendations in our December 1990 report to evaluate whether those recommendations have made or could make improvements in the detection and deterrence of unauthorized grazing.³

We conducted this performance audit from May 2015 to July 2016 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

³GAO, *Rangeland Management: BLM Efforts to Prevent Unauthorized Livestock Grazing Need Strengthening*, [GAO/RCED-91-17](#) (Washington, D.C.: Dec. 7, 1990). This December 1990 report focused solely on BLM; grazing on Forest Service lands was not covered in the report.

Appendix II: Grazing Information for the Bureau of Land Management and U.S. Forest Service

This appendix provides detailed information on grazing permits, leases, fees, and penalties on lands managed by the Bureau of Land Management (BLM), within the Department of the Interior, and the U.S. Forest Service, within the Department of Agriculture. Specifically, the information includes acres available for grazing on lands the agencies manage, the animal unit months (AUM) approved for grazing, and the AUMs billed for BLM and the Forest Service;¹ BLM and Forest Service permits and leases by size; and information on BLM and Forest Service grazing fees for permitted grazing and penalties for unauthorized grazing. The agencies are in two different departments and their grazing programs are covered by different laws and regulations. Therefore, the agencies maintain their own databases and, in some cases, track different data elements. As a result, consistent information was not always available from the two agencies, and in some cases the information provided was from different years depending on what was the most recently available at the time of our request.

Acres and AUMs of Grazing

This section provides an overview of the most recent information available at the time of our review on grazing that occurred on BLM and Forest Service lands. The acres of BLM and Forest Service land available for grazing each year can change, depending on the results of environmental assessments conducted on grazing allotments, and the amount of grazing that is allowed each year can change, depending on annual assessments of forage and range conditions. Both agencies measure the number of acres of their lands available for grazing by allotment each year, but the two agencies use different terms to measure the amount of grazing. BLM calls this amount active or authorized, and the Forest Service calls this amount permitted. Similarly, BLM refers to the amount of grazing that it bills for annually—which can vary from the amount it authorizes because of range or climate conditions—as billed, and the Forest Service refers to this amount of grazing as authorized.

¹Treated as equivalent measures for fee purposes, BLM's AUM and the Forest Service's head month refer to the amount of forage necessary for the sustenance of one cow or its equivalent for a period of one month. We use AUM in this appendix to refer to both AUM and head month. For grazing fee purposes, BLM defines an AUM as a month's use and occupancy of range by 1 cow, bull, steer, heifer, horse, burro, mule, 5 sheep, or 5 goats, over the age of 6 months at the time of entering the public lands or other lands administered by the BLM; by any such weaned animals regardless of age; and by such animals that will become 12 months of age during the authorized period of use.

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We use “AUMs approved” to refer to the amounts of grazing authorized by BLM and permitted by the Forest Service and “AUMs billed” to refer to the amount of grazing for which BLM billed ranchers and the amount of grazing authorized each year on Forest Service lands. Table 5 shows the acres and AUMs approved as of January 2016 and AUMs grazed for BLM’s field offices in fiscal year 2014, the most recent year available.

Table 5: Bureau of Land Management (BLM) Data on Acres and Animal Unit Months (AUM) by Field Office as of January 2016 and AUMs Billed for Fiscal Year 2014

State	Acres	AUMs approved	AUMs billed
Arizona			
Agua Fria National Monument	79,553	13,492	5,950
Arizona Strip	1,780,689	118,756	79,528
Grand Canyon/Parashant National Monument	722,473	35,600	21,302
Hassayampa	957,484	68,074	54,072
Ironwood Forest National Monument	135,278	8,049	6,449
Kingman	2,715,596	120,660	119,205
Las Cienegas National Conservation Area	44,474	10,212	19,795
Lower Sonoran	779,431	15,513	7,073
Safford Field	1,373,882	133,913	80,363
San Pedro Riparian National Conservation Area	14,993	1,536	1,540
Sonoran Desert National Monument	472,817	17,785	4,546
Tucson	425,410	37,465	34,530
Vermilion Cliffs National Monument	233,305	25,774	5,831
Yuma	965,352	27,353	10,024
Subtotal	10,700,737	634,182	450,208
California			
Alturas	455,535	51,801	29,056
Arcata	21,832	963	1,073
Bakersfield	307,820	30,287	20,818
Barstow	455,651	6,053	1,108
Bishop	603,302	35,156	7,063
Carrizo Plain National Monument	160,069	59,865	0
Eagle Lake	996,323	52,991	25,916
Hollister	178,069	24,650	15,274
King Range National Conservation Area	11,110	2,030	605
Mother Lode	43,821	3,645	2,883
Needles	560,576	7,737	3,746

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State	Acres	AUMs approved	AUMs billed
Palm Springs-South Coast	83,851	2,542	0
Redding	24,331	4,015	3,818
Ridgecrest	1,192,904	12,260	4,421
Surprise	1,450,332	84,710	54,317
Ukiah	10,960	1,528	1,788
Subtotal	6,556,486	380,233	171,886
Colorado			
Canyon Ancients National Monument	158,051	6,739	4,110
Colorado River Valley	506,024	43,224	28,553
Dominguez-Escalante National Conservation Area	198,349	12,684	5,255
Grand Junction	1,037,874	64,791	31,474
Gunnison	517,175	34,571	17,616
Gunnison Gorge National Conservation Area	88,064	6,117	1,315
Kremmling	337,162	34,822	30,324
Little Snake	1,323,289	142,312	74,395
McInnis Canyons National Conservation Area	69,585	2,192	128
Royal Gorge	608,052	35,163	19,494
San Luis Valley	456,357	29,184	11,009
Tres Rios	416,128	20,672	17,944
Uncompahgre	651,417	35,972	18,088
White River	1,460,013	118,299	61,978
Subtotal	7,827,540	586,742	321,683
Idaho			
Birds of Prey National Conservation Area	584,696	46,828	26,190
Bruneau	1,400,837	127,233	69,108
Burley	862,278	141,872	100,429
Challis	737,886	58,098	31,859
Cottonwood	93,236	5,268	3,905
Craters of the Moon National Monument	111,101	14,956	3,675
Four Rivers	737,656	106,048	73,831
Jarbidge	1,635,041	184,000	140,907
Owyhee	1,239,234	105,705	94,875
Pocatello	574,541	84,948	69,483
Salmon	492,410	62,610	44,755
Shoshone	1,440,777	182,188	92,726
Upper Snake River	1,594,266	206,306	130,469
Subtotal	11,503,959	1,326,060	882,212

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State	Acres	AUMs approved	AUMs billed
Montana			
Billings	403,179	54,419	46,871
Butte	264,905	23,343	19,270
Dillon	835,039	101,902	68,105
Glasgow	1,012,713	144,830	142,529
Havre	646,536	94,072	79,738
Lewistown	830,505	124,665	115,529
Malta	1,020,225	169,361	157,316
Miles City	2,891,140	550,778	520,310
Missoula	99,327	5,500	4,719
North Dakota	52,263	9,270	7,303
South Dakota	273,664	73,762	70,067
Subtotal	8,329,496	1,351,902	1,231,757
Nevada			
Black Rock	1,863,296	56,159	42,132
Caliente	3,957,689	147,477	53,933
Egan	3,627,448	143,832	62,776
Humboldt River	7,411,067	279,276	154,848
Las Vegas	192,824	0	649
Mount Lewis	4,323,051	244,790	121,258
Schell	3,522,686	223,067	87,868
Sierra Front	1,138,540	55,760	15,268
Stillwater	3,903,234	103,269	39,058
Tonopah	6,026,508	134,092	68,155
Tuscarora	2,974,584	370,574	243,668
Wells	4,194,182	320,527	170,712
Subtotal	43,135,109	2,078,823	1,060,325
New Mexico			
Carlsbad	1,996,948	375,688	285,216
Farmington	1,371,751	121,757	82,615
Fort Stanton Snowy River Cave National Conservation Area	80	15	24
Las Cruces	4,028,279	554,220	403,910
Organ Mountains Desert Peaks National Monument	903,664	86,271	56,417
Prehistoric Trackways National Monument	19,292	1,457	884
Rio Puerco	950,758	127,520	85,759
Roswell	1,428,688	310,903	231,063

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State	Acres	AUMs approved	AUMs billed
Socorro	1,491,206	230,287	171,803
Taos	519,358	42,570	21,119
Subtotal	12,710,024	1,850,688	1,338,810
Oregon			
Andrews Resource Area	1,154,850	66,237	37,569
Ashland Resource Area	195,874	5,043	4,180
Baker	395,564	46,965	40,997
Border Resource Area	124,415	12,452	10,811
Butte Falls Resource Area	136,408	5,062	1,480
Central Oregon Resource Area	884,499	62,624	39,411
Coos Bay	541	49	0
Deschutes Resource Area	696,364	52,629	33,752
Jordan	2,537,453	187,049	127,513
Klamath Falls Resource Area	208,878	12,762	9,656
Lakeview Resource Area	2,931,263	164,311	100,636
Malheur Resource Area	2,081,454	233,223	209,744
Roseburg	11,879	0	0
Steens Mountain Cooperative Management and Protection Area	442,872	29,682	21,375
Three Rivers Resource Area	1,679,931	152,101	123,915
Wenatchee Resource Area	198,064	20,374	18,096
Subtotal	13,680,309	1,050,563	779,135
Utah			
Cedar City	2,079,317	140,227	93,080
Fillmore	4,315,435	262,250	177,505
Grand Stairway-Escalante National Monument	1,807,456	76,551	46,171
Kanab	435,168	18,932	10,449
Moab	1,808,949	90,331	46,856
Monticello	2,012,867	74,438	51,160
Price	2,218,572	100,346	58,871
Richfield	2,250,671	101,518	83,568
Salt Lake	2,374,663	180,986	123,232
St. George	566,127	27,826	20,219
Vernal	1,704,141	129,448	77,078
Subtotal	21,573,366	1,202,853	788,189
Wyoming			
Buffalo	798,328	104,059	107,773

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State	Acres	AUMs approved	AUMs billed
Casper	1,313,617	185,631	169,283
Cody	1,109,918	77,439	32,878
Kemmerer	1,447,232	152,228	123,512
Lander	2,349,790	254,166	161,493
Newcastle	288,048	48,719	46,981
Pinedale	885,129	111,041	93,004
Rawlins	3,542,028	448,947	247,746
Rock Springs	3,602,134	303,268	131,703
Worland	2,055,501	221,874	147,763
Subtotal	17,391,725	1,907,372	1,262,136
Total	153,408,751	12,369,418	8,286,341

Source: BLM data. | GAO-16-559

Notes: Public acres (BLM land) in allotments available for grazing and permitted active AUMs, as of January 2016. Billed AUMs are for bills due from October 1, 2013, through September 30, 2014. We use “AUMs approved” to refer to the amounts of grazing authorized by BLM and “AUMs billed” to refer to the amount of grazing for which BLM billed ranchers.

Treated as equivalent measures for fee purposes, BLM’s AUM and the Forest Service’s head month refer to the amount of forage necessary for the sustenance of one cow or its equivalent for a period of one month. We use AUM in this appendix to refer to both AUM and head month. For grazing fee purposes, BLM defines an AUM as a month’s use and occupancy of range by 1 cow, bull, steer, heifer, horse, burro, mule, 5 sheep, or 5 goats, over the age of 6 months at the time of entering the public lands or other lands administered by the BLM; by any such weaned animals regardless of age; and by such animals that will become 12 months of age during the authorized period of use.

Table 6 shows the acres of grazing available, approved AUMs, and billed AUMs in grazing year 2015 for Forest Service administrative offices and grasslands. The data on acres include acres in active and vacant allotments but not in allotments that have been closed that are not available for grazing. The data on AUMs include data that the Forest Service calls head months. Unlike BLM, the Forest Service uses two methods to tally the amount of grazing that occurs—AUMs and head months. The agency uses AUM to refer to the amount of forage consumed by different types of livestock, while it uses the term head months to refer to the number of livestock (head) that are grazed and that are subject to billing. We used the Forest Service head month data because they are equivalent to the BLM’s data on billed AUMs, but we used AUM to simplify the comparison with BLM’s grazing data.

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Table 6: U.S. Forest Service Data on Acres and Animal Unit Months (AUM), by Forest and Grassland, Grazing Year 2015

Regions	Acres	AUMs approved	AUMs billed
Region 1, Northern Region			
Beaverhead-Deerlodge National Forest	2,551,472	169,030	163,438
Bitterroot National Forest	188,577	1,499	1,500
Idaho Panhandle National Forests	139,487	2,536	2,206
Flathead National Forest	102,747	1,407	1,032
Custer Gallatin National Forest	1,292,085	210,727	197,326
Helena National Forest	561,019	36,765	38,049
Kootenai National Forest	480,919	4,769	4,303
Lewis and Clark National Forest	921,533	57,611	54,560
Lolo National Forest	159,993	2,069	2,069
Nez Perce-Clearwater National Forest	672,190	26,532	26,375
Dakota Prairie Grasslands	1,802,159	679,288	917,935
Subtotal	8,872,181	1,192,233	1,408,793
Region 2, Rocky Mountain Region			
Bighorn National Forest	977,074	82,473	79,079
Black Hills National Forest	1,276,337	111,453	109,816
Grand Mesa, Uncompahgre, and Gunnison National Forests	2,818,480	255,528	232,636
Medicine Bow-Routt National Forest	3,638,739	329,378	251,981
Nebraska National Forest	1,123,701	334,960	422,303
Rio Grande National Forest	1,613,849	75,990	73,076
Arapaho-Roosevelt National Forest	773,610	56,013	102,647
Pike-San Isabel National Forest	1,977,583	139,249	139,221
San Juan National Forest	1,632,333	89,987	89,745
Shoshone National Forest	1,164,058	42,737	43,331
White River National Forest	1,523,509	111,614	106,458
Subtotal	18,519,273	1,629,382	1,650,293
Region 3, Southwestern Region			
Apache-Sitgreaves National Forest	8,052,607	129,802	120,980
Carson National Forest	1,348,869	93,847	86,925
Cibola National Forest	1,793,238	147,990	134,348
Coconino National Forest	1,610,501	81,977	79,912
Coronado National Forest	1,596,356	256,652	251,567
Gila National Forest	2,978,328	231,123	211,164
Kaibab National Forest	1,386,138	65,145	57,798
Lincoln National Forest	978,702	120,792	132,678

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Regions	Acres	AUMs approved	AUMs billed
Prescott National Forest	1,354,782	146,521	127,957
Santa Fe National Forest	1,492,128	78,815	76,461
Tonto National Forest	2,784,970	169,095	164,877
Subtotal	25,376,619	1,521,759	1,444,667
Region 4, Intermountain Region			
Ashley National Forest	1,049,888	54,993	50,708
Boise National Forest	1,700,996	39,066	37,399
Bridger-Teton National Forest	3,712,552	117,273	110,009
Dixie National Forest	1,738,683	86,186	84,689
Fishlake National Forest	1,448,260	155,862	152,054
Manti-LaSal National Forest	1,330,748	122,631	121,362
Payette National Forest	1,085,383	60,579	57,799
Salmon-Challis National Forest	2,596,054	108,251	101,540
Sawtooth National Forest	1,699,128	138,219	131,700
Caribou-Targhee National Forest	2,382,927	280,938	273,173
Humboldt-Toiyabe National Forest	5,607,269	244,621	236,951
Uinta-Wasatch-Cache National Forest	1,535,377	161,818	161,837
Subtotal	25,887,265	1,570,437	1,519,221
Region 5, Pacific Southwest Region			
Angeles National Forest	0	0	0
Cleveland National Forest	144,215	2,419	2,418
Eldorado National Forest	536,927	4,738	4,059
Inyo National Forest	971,786	17,005	17,054
Klamath National Forest	968,233	20,345	18,412
Lassen National Forest	1,195,377	19,869	14,763
Los Padres National Forest	854,003	9,359	9,304
Mendocino National Forest	568,918	5,439	5,439
Modoc National Forest	1,788,200	109,588	97,691
Six Rivers National Forest	294,977	4,846	4,732
Plumas National Forest	904,698	18,037	14,707
San Bernardino National Forest	230,179	1,504	1,505
Sequoia National Forest	941,611	24,615	24,412
Shasta Trinity National Forest	633,732	3,059	2,970
Sierra National Forest	921,905	15,676	15,659
Stanislaus National Forest	802,969	17,477	17,291
Tahoe National Forest	536,853	7,348	6,269
Lake Tahoe Basin Management Unit	33,993	0	0

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Regions	Acres	AUMs approved	AUMs billed
Subtotal	12,328,576	281,324	256,685
Region 6, Pacific Northwest Region			
Deschutes National Forest	229,888	18,388	12,538
Fremont-Winema National Forests	2,022,393	85,016	85,395
Gifford Pinchot National Forest	32,988	1,366	1,366
Malheur National Forest	1,679,423	118,363	108,492
Mt Baker-Snoqualmie National Forest	0	0	0
Mt Hood National Forest	172,087	1,515	1,515
Ochoco National Forest	667,468	56,932	51,914
Olympic National Forest	0	0	0
Rogue River-Siskiyou National Forest	577,953	12,234	10,826
Siuslaw National Forest	0	0	0
Umatilla National Forest	859,814	47,592	43,901
Umpqua National Forest	130,813	1,110	1,107
Wallowa Whitman National Forest	1,599,135	120,381	112,169
Okanogan-Wenatchee National Forests	1,590,538	46,689	45,198
Willamette National Forest	0	0	0
Colville National Forest	896,133	28,709	26,564
Columbia River Gorge National Scenic Area	5,000	118	117
Subtotal	10,463,633	538,413	501,102
Region 8, Southern Region			
National Forests in Alabama	0	0	0
Daniel Boone National Forest	0	0	0
Chattahoochee-Oconee National Forest	1,811	1,768	0
Cherokee National Forest	254	0	0
National Forests in Florida	5,000	792	0
Kisatchie National Forest	24,153	271	232
National Forests in Mississippi	200	37	37
George Washington And Jefferson National Forests	8,223	5,859	3,011
Ouachita National Forest	114,612	3,435	1,064
Ozark-St. Francis National Forest	118,344	4,111	3,226
National Forests in North Carolina	0	0	0
Francis Marion-Sumter National Forests	0	0	0
National Forests in Texas	37,395	5,805	7,044
Subtotal	309,992	22,078	14,614
Region 9, Eastern Region			
Chippewa National Forest	75	221	0

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Regions	Acres	AUMs approved	AUMs billed
Huron Manistee National Forest	0	0	0
Mark Twain National Forest	19,544	15,601	2,375
Ottawa National Forest	0	0	0
Shawnee National Forest	1,489	0	0
Superior National Forest	0	0	0
Hiawatha National Forest	0	0	0
Hoosier National Forest	0	0	0
Chequamegon-Nicolet National Forest	0	0	0
Wayne National Forest	960	0	0
Midewin National Tallgrass Prairie	4,683	10,202	8,833
Allegheny National Forest	0	0	0
Green Mountain and Finger Lakes National Forests	5,053	12,603	0
Monongahela National Forest	6,086	5,654	730
White Mountain National Forest	0	0	0
Subtotal	37,890	44,281	11,938
Total	101,795,429	6,799,907	6,807,313

Source: U.S. Forest Service data. | GAO-16-559

Notes: The Forest Service has no Region 7.

The Forest Service charges the grazing fee rate by head month, which is an equivalent measure to AUM for fee purposes—the amount of forage one cow and her calf, one horse, or five sheep eat in a month.

We use “AUMs approved” to refer to the amounts of grazing permitted by the Forest Service and “AUMs billed” to refer to the amount of grazing authorized each year on Forest Service lands.

Permits and Leases by Size

Because the number of AUMs per permit or lease can vary greatly, the number of AUMs controlled by permittees or lessees also varies greatly. Tables 7 through 9 show the number of BLM and Forest Service permits and leases, and AUMs, by permit size. Multiple permits or leases may be contained on a single allotment, just as one permit or lease may span multiple allotments. In addition, several ranchers may share one permit or lease, just as one rancher may possess multiple permits or leases; therefore, the number of permits and leases does not necessarily correlate to the total number of ranchers. Table 7 shows the size of BLM

permits and leases, using approved AUMs as of December 2015. The data do not include permits and leases with less than two AUMs.²

Table 7: Number of Bureau of Land Management Grazing Permits and Leases by Size, as of December 2015

Size of permit or lease in animal unit months (AUM)	Number of permits and leases	Total approved AUMs
2 to 10	1,216	8,326
11 to 100	6,011	267,857
101 to 500	5,574	1,372,933
501 to 1,000	1,920	1,362,542
1,001 to 5,000	2,512	5,244,949
5,001 to 10,000	279	1,879,153
Over 10,000	137	2,233,618
Total	17,649	12,369,378

Source: Bureau of Land Management data. | GAO-16-559

Notes: 43 C.F.R. § 4100.0-5 defines an AUM as the amount of forage necessary for the sustenance of one cow or its equivalent for a period of 1 month.

We start with two AUMs because we re-created a table from previous reports: GAO, *Rangeland Management: Profile of the Bureau of Land Management's Grazing Allotments and Permits*, GAO/RCED-92-213FS (Washington, D.C.: June 10, 1992), and *Livestock Grazing: Federal Expenditures and Receipts and Vary, Depending on the Agency and the Purpose of the Fee Charged*, GAO-05-869 (Washington, D.C.: Sept. 30, 2005).

Table 8 shows Forest Service permits for cattle for regions with lands in western states (regions 1 through 6). The data do not include horses or other livestock and do not include permits with fewer than two AUMs of grazing for cattle.

²The agencies re-created tables that we produced in a previous report: GAO, *Livestock Grazing: Federal Expenditures and Receipts and Vary, Depending on the Agency and the Purpose of the Fee Charged*, GAO-05-869 (Washington, D.C.: Sept. 30, 2005). The tables in the September 2005 report were also re-created versions of tables used in two older previous reports: GAO, *Rangeland Management: Profile of the Bureau of Land Management's Grazing Allotments and Permits*, GAO/RCED-92-213FS (Washington, D.C.: June 10, 1992), and *Rangeland Management: Profile of the Forest Service's Grazing Allotments and Permittees*, GAO/RCED-93-141FS (Washington, D.C.: Apr. 28, 1993).

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Table 8: Number of U.S. Forest Service Cattle Permits by Size, Grazing Year 2015

Size of permits in animal unit months (AUM)	Number of permits	Total approved AUMs
2 to 10	17	99
11 to 100	586	34,684
101 to 500	2,123	579,308
501 to 1,000	1,206	866,929
1,001 to 5,000	1,700	3,477,745
5,001 to 10,000	177	1,195,694
Over 10,000	51	1,840,639
Total	5,860	7,995,098

Source: U.S. Forest Service data. | GAO-16-559

Notes: The Forest Service charges the grazing fee rate by head months, an equivalent measure to AUMs for fee purposes—the amount of forage one cow and her calf, one horse, or five sheep eat in a month.

We start with two AUMs because we re-created a table from previous reports: GAO, *Rangeland Management: Profile of the Forest Service’s Grazing Allotments and Permittees*, [GAO/RCED-93-141FS](#) (Washington, D.C.: Apr. 28, 1993), and *Livestock Grazing: Federal Expenditures and Receipts and Vary, Depending on the Agency and the Purpose of the Fee Charged*, [GAO-05-869](#) (Washington, D.C.: Sept. 30, 2005).

Forest Service sheep permits are shown in table 9. For the purposes of conversion, five sheep equal one AUM. In addition to the sheep, an insignificant number of horses are included in the data because, in some cases, permittees may keep a horse for herding the sheep.

Table 9: Number of U.S. Forest Service Sheep Permits by Size, Grazing Year 2015

Size of permits in animal unit months (AUM)	Number of permits	Total approved AUMs
50 to 500	63	18,067
501 to 1,500	131	131,512
1,501 to 5,000	131	346,036
5,001 to 15,000	24	181,022
15,001 to 25,000	0	0
Over 25,000	1	26,000
Total	350	702,637

Source: U.S. Forest Service data. | GAO-16-559

Notes: The Forest Service charges the grazing fee rate by head month, an equivalent measure to AUMs for fee purposes—the amount of forage one cow and her calf, one horse, or five sheep eat in a month.

This table does not include permits with less than 50 AUMs. We start at 50 AUM because we re-created a table from a previous report, GAO, *Livestock Grazing: Federal Expenditures and Receipts*

and Vary, Depending on the Agency and the Purpose of the Fee Charged, [GAO-05-869](#) (Washington, D.C.: Sept. 30, 2005).

Calculation of Grazing Fees and Unauthorized Grazing Penalties for BLM's and the Forest Service's Western States

Historically, BLM and Forest Service permitted grazing fees were established to achieve different objectives—to recover administrative expenses or to reflect livestock prices, respectively—but the agencies began using the same approach to setting fees in 1969. Over the years, the agencies, as well as outside entities, have conducted numerous studies attempting to establish a permitted grazing fee that meets the objectives of multiple parties. As of March 2016, the permitted grazing fee for BLM and the Forest Service in 16 western states is based on a formula which incorporates factors that take into account ranchers' ability to pay and was established in 1978 based on studies conducted in the 1960s and 1970s.³

In 2016, the permitted grazing fee for lands managed by BLM and the Forest Service in 16 western states was \$2.11 per AUM—or the amount of forage needed to sustain a cow and her calf for 30 days.⁴ This permitted grazing fee is set annually according to a formula established in the Public Rangelands Improvement Act of 1978 and extended indefinitely by Executive Order 12,548 that has been incorporated into the agencies' regulations.⁵ The formula is as follows:

$$\text{Fee} = \$1.23 \times (\text{FVI} + \text{BCPI} - \text{PPI}) / 100$$

where \$1.23 = the base value, or the difference between the costs of conducting ranching business on private lands, including any grazing fees charged, and public lands, not including grazing fees. The costs were computed in a 1966 study that included 10,000 ranching businesses in the western states.

³The 16 western states are Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Utah, Washington, and Wyoming.

⁴While BLM uses AUM as a unit for purposes of charging fees, the Forest Service uses head month. The two units are calculated the same way. We use AUM in this appendix to refer to both AUM and head month.

⁵Pub. L. No. 95-514, 92 Stat. 1803.

FVI = Forage Value Index, or the weighted average estimate of the annual rental charge per head per month for pasturing cattle on private rangelands in 11 western states (Arizona, California, Colorado, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, Washington, and Wyoming) divided by \$3.65 per head month (the private grazing land lease rate for the base period of 1964-68) and multiplied by 100.

BCPI = Beef Cattle Price Index, or the weighted average annual selling price for beef cattle (excluding calves) in the 11 western states divided by \$22.04 per hundredweight (the beef cattle price per hundred pounds for the base period of 1964-68) and multiplied by 100.

PPI = Prices Paid Index, for selected components from the Department of Agriculture's National Agricultural Statistics Service's Index of Prices Paid by Farmers for Goods and Services, adjusted by different weights (in parentheses) to reflect livestock production costs in the western states [fuels and energy (14.5), farm and motor supplies (12.0), autos and trucks (4.5), tractors and self-propelled machinery (4.5), other machinery (12.0), building and fencing materials (14.5), interest (6.0), farm wage rates (14.0), and farm services (cash rent) (18.0)].

The Public Rangelands Improvement Act of 1978 limited the annual increase or decrease in the resulting fee to 25 percent. It also established the fee formula for a 7-year trial period and required that the effects of the fee be evaluated at the end of that period. Although the permitted grazing fee formula under the act expired in 1986, the use of the fee formula was extended indefinitely by Executive Order 12,548 and incorporated into the agencies' regulations. The executive order requires the Secretaries of the Interior and Agriculture to establish permitted grazing fees according to the act's formula, including the 25 percent limit on increases or decreases in the fee. In addition, the order established that the permitted grazing fee should not be lower than \$1.35 per AUM.

To calculate its penalty for unauthorized grazing, the Forest Service uses the same formula as for the permitted fee but replaces the base value of \$1.23 with a higher base value of \$3.80. In addition, the Forest Service does not apply the 25 percent limit on the annual increase or decrease in the penalty and does not set a lower limit on the penalty as with the permitted fee formula (see table 10). In contrast, BLM bases its penalties for unauthorized on the state by state commercial value of forage. According to the National Agricultural Statistics Service, based on the average private grazing land lease rate per AUM, the state-by-state

Appendix II: Grazing Information for the
Bureau of Land Management and U.S. Forest
Service

commercial value of forage in western states ranged from \$9 to \$39 in grazing year 2016.

Table 10: U.S. Forest Service’s Formula Results for Permitted Grazing Fees and Unauthorized Grazing Penalties, Grazing Years 2001–2016

Grazing year	Permitted grazing fees		U.S. Forest Service penalties for unauthorized grazing	
	Formula result	Fee	Formula result	Penalty
2001	\$1.08	\$1.35	\$3.34	\$3.34
2002	1.43	1.43	4.41	4.41
2003	1.23	1.35	3.80	3.80
2004	1.43	1.43	4.41	4.41
2005	1.98	1.79	6.12	6.12
2006	1.56	1.56	4.83	4.83
2007	1.33	1.35	4.10	4.10
2008	0.73	1.35	2.24	2.24
2009	(0.65)	1.35	(2.01)	2.24
2010	(0.22)	1.35	(0.68)	2.24
2011	(0.33)	1.35	(1.03)	2.24
2012	0.28	1.35	0.87	2.24
2013	0.81	1.35	2.51	2.51
2014	0.75	1.35	2.31	2.31
2015	2.10	1.69	6.48	2.89
2016	3.46	2.11	10.68	10.68

Source: GAO analysis and U.S. Forest Service data. | GAO-16-559

Note: The Forest Service’s formula for calculating its penalty for unauthorized grazing does not include a lower limit or a limit on the increase or decrease. In grazing year 2008, the penalty fell to \$2.24 and would have fallen into negative numbers under the formula in subsequent years. To address this situation, the Forest Service decided to hold the penalty at \$2.24 from 2009 to 2012 until the formula produced a higher penalty in 2013: \$2.51. In 2015, the Forest Service erroneously applied a limit of 25 percent on the increase of the penalty; the penalty with the limit was \$2.89, while the penalty without an increase limit under the formula would have been \$6.48. The agency did not apply a limit on the increase in 2016 to calculate a penalty of \$10.68.

Appendix III: Detailed Information on the Extent and Frequency of Unauthorized Grazing

This appendix provides detailed information on the extent and frequency of unauthorized grazing incidents and charges recorded in the Bureau of Land Management's (BLM) and the U.S. Forest Service's range management and law enforcement databases, for grazing years 2010 through 2014.¹ BLM, within the Department of the Interior, and the U.S. Forest Service, within the Department of Agriculture, are in two different departments and their grazing programs are covered by different laws and regulations. Therefore, the agencies maintain their own databases and, in some cases, track different data elements. As a result, consistent information was not always available from the two agencies.

BLM Range Program Data

BLM's range management database contained records of 433 unauthorized grazing incidents that occurred in grazing years 2010 through 2014 and were settled and billed by December 28, 2015 (the date the data were queried) (see table 11). Incidents not billed by December 28, 2015, are not included, nor are incidents that were resolved nonmonetarily. The number of incidents ranged from 76 in Idaho to 5 in Arizona.

Table 11: Bureau of Land Management Range Program Unauthorized Grazing Incidents by State Office, Grazing Years 2010–2014

State office	Incidents
Arizona	5
California	29
Colorado	38
Idaho	76
Montana/Dakotas	29
New Mexico	65
Nevada	44
Oregon	48
Utah	52
Wyoming	47
Total	433

Source: Bureau of Land Management data. | GAO-16-559

¹A grazing year for billing purposes is March 1 to February 28. For example, grazing year 2014 was from March 1, 2014, to February 28, 2015.

**Appendix III: Detailed Information on the
Extent and Frequency of Unauthorized Grazing**

Notes: The unauthorized grazing incidents occurred in grazing years 2010 through 2014 and were settled and billed by December 28, 2015. Incidents not billed by December 28, 2015, are not included, nor are incidents that were resolved nonmonetarily.

The administrative state is not the same as the geographic state; the administrative state can cross geographic state lines. The Montana/Dakotas State Office covers Montana, North Dakota, and South Dakota. The New Mexico State Office covers New Mexico, Kansas, Oklahoma, and Texas. The Oregon State Office covers Oregon and Washington. The Wyoming State Office covers Wyoming and Nebraska.

The grazing year used for billing grazing fees is March 1 to February 28.

The bills identified for the 433 incidents in BLM's range management database included 466 charges for different types of unauthorized grazing; non-willful (unintentional), willful (intentional), and repeated willful, each of which is charged at a different rate (see table 12). The total charges (466) exceeds the total number of incidents settled and billed (433) because each bill can include charges for more than one type of unauthorized grazing and for more than 1 grazing year. Non-willful unauthorized grazing was the most common type in grazing years 2010 through 2014, accounting for 299—or 64 percent—of the charges recorded; willful unauthorized grazing was 31 percent of the total, and repeated willful was 5 percent.

Table 12: Bureau of Land Management Range Program Unauthorized Grazing Charges by Type and Grazing Year, 2010–2014

Unauthorized grazing type	Grazing year					Total	Percentage of total
	2010	2011	2012	2013	2014		
Non-willful	56	52	74	81	36	299	64%
Willful	30	20	28	42	24	144	31%
Repeated willful	3	3	6	8	3	23	5%
Total	89	75	108	131	63	466	100%

Source: GAO analysis of Bureau of Land Management data. | GAO-16-559

Notes: A single bill for unauthorized grazing may include charges for multiple types of unauthorized grazing. For example, a bill may include charges for non-willful (unintentional) unauthorized grazing and for willful or repeated willful (intentional) unauthorized grazing, each of which is charged at a different rate. Therefore, in this table the total number of charges (466) exceeds the total number of bills issued (433). For the purpose of this report, we used the number of bills to represent the number of unauthorized grazing incidents.

The unauthorized grazing bills reflect incidents that occurred in grazing years 2010 through 2014 and were settled and billed by December 28, 2015. Additional incidents not billed by December 28, 2015, are not included.

The grazing year used for billing grazing fees is March 1 to February 28.

BLM's unauthorized grazing bills included charges for unauthorized grazing penalties; administrative charges for costs of the agency's response; and other charges, fees, and interest. As of March 1, 2015, BLM had billed about \$441,000 for unauthorized grazing charges in grazing years 2010 through 2014 (see table 13). BLM had collected about \$426,000 of the amount; after adjustments, about \$8,000 of the charges remained due.

Table 13: Status of the Bureau of Land Management Range Program's Unauthorized Grazing Bill Charges Issued for Grazing Years 2010–2014

Type of charge	Billed amount	Amount collected	Adjustments	Balance due
Unauthorized grazing penalties	\$325,850.64	\$319,977.98	(\$1,408.06)	\$4,464.60
Administrative charges	108,433.71	102,500.02	(2,491.43)	\$3,442.26
Service fees	770.00	729.30	(40.70)	\$0.00
Handling charges	345.00	210.00	(105.00)	\$30.00
Interest charges	160.37	96.44	(47.61)	\$16.32
Late fees	4,729.93	1,740.43	(2,700.70)	\$288.80
Penalty charges	922.14	538.55	(285.65)	\$97.94
Total	\$441,211.79	\$425,792.72	(\$7,079.15)	\$8,339.92

Source: GAO analysis of Bureau of Land Management data. | GAO-16-559

Notes: Data are accurate as of March 1, 2016, when the data were queried from the Bureau of Land Management's Collection and Billing System database. The data reflect charges with a bill date in grazing years 2010 through 2014 and therefore do not correspond directly to incidents that occurred during this period.

BLM's unauthorized grazing bills included charges for unauthorized grazing penalties; administrative charges for costs of the agency's response; and other charges, fees, and interest.

The grazing year used for billing grazing fees is March 1 to February 28.

BLM's range management database contained records of nearly 53,000 grazing compliance inspections performed by agency field staff during grazing years 2010 through 2014 (see table 14). Of the nearly 53,000 inspections, about 1,500—or 3 percent—identified possible noncompliance. Possible noncompliance means noncompliance was suspected but not yet confirmed by the individual completing the compliance inspection and was identified for further investigation. Therefore some inspections recorded as a finding of possible noncompliance, upon further investigation, may not have resulted in a finding of a violation.

Table 14: Bureau of Land Management Range Program Compliance Inspections by State Office and Outcome, Grazing Years 2010–2014

State office	Outcome of compliance inspection		Total	Percentage with possible noncompliance identified
	No noncompliance identified	Possible noncompliance identified		
Arizona	1,307	48	1,355	4%
California	1,936	184	2,120	9%
Colorado	3,974	143	4,117	3%
Idaho	22,106	144	22,250	1%
Montana/Dakotas	5,213	159	5,372	3%
New Mexico	1,936	65	2,001	3%
Nevada	3,319	229	3,548	6%
Oregon	2,666	194	2,860	7%
Utah	3,349	162	3,511	5%
Wyoming	5,524	190	5,714	3%
Total	51,330	1,518	52,848	3%

Source: GAO analysis of Bureau of Land Management compliance inspection data. | GAO-16-559

Note: Possible noncompliance means noncompliance was suspected but not confirmed and identified for further investigation by the individual completing the grazing compliance inspection. Therefore, some inspections recorded as a finding of possible noncompliance, upon further investigation, may not have resulted in a finding of a violation.

BLM Law Enforcement Data

BLM's law enforcement database contained records of 426 incidents where formal documentation, such as an incident report (record of observation), warning notice, or violation notice, was prepared by a law enforcement officer and entered into the database in grazing years 2010 through 2014 (see table 15). The number of incidents ranges from 71 in Wyoming to 17 in Arizona and Utah. From grazing years 2010 through 2014, the year with the most incidents recorded in the law enforcement database was 2013; 123 incidents were recorded, or nearly 30 percent of the 426 total incidents. According to agency officials, some of the data may include incidents that were miscoded as grazing related when entered into the law enforcement database, and a small proportion of the incidents include violations of grazing permits other than unauthorized grazing, such as supplementing the existing forage with additional livestock feed.

Table 15: Bureau of Land Management Law Enforcement Unauthorized Grazing Incidents by State Office and Grazing Year, 2010–2014

State office	2010	2011	2012	2013	2014	Total
Arizona	1	5	3	5	3	17
California	13	7	8	27	5	60
Colorado	6	14	12	16	8	56
Idaho	5	5	6	14	7	37
Montana/Dakotas	8	2	7	10	8	35
New Mexico	9	4	7	13	24	57
Nevada	37	1	3	5	2	48
Oregon	8	5	5	4	6	28
Utah	1	4	5	6	1	17
Wyoming	15	14	15	23	4	71
Total	103	61	71	123	68	426

Source: Bureau of Land Management data. | GAO-16-559

Notes: According to agency officials, some of the data may include incidents that were miscoded as grazing related when entered into the law enforcement database.

Some incidents include violations of grazing permits other than unauthorized grazing, such as supplementing the existing forage with additional livestock feed.

The grazing year used for billing grazing fees is March 1 to February 28.

Forest Service Range Program Data

The Forest Service’s range management database contained records of 190 unauthorized grazing incidents in grazing years 2010 through 2014 (see table 16). The number of incidents is based on the number of bills issued and also includes some unauthorized grazing incidents confirmed by Forest Service field offices as having occurred where no bill was issued. Additional incidents may have occurred that were not billed and were not entered in the Forest Service database. The number of incidents ranged from 65 in the Southwestern Region to 2 in the Southern Region.

Table 16: U.S. Forest Service Range Program Unauthorized Grazing Incidents by Region, Grazing Years 2010–2014

Forest Service region	Incidents
Northern	19
Rocky Mountain	47
Southwestern	65
Intermountain	36
Pacific Southwest	8
Pacific Northwest	9

**Appendix III: Detailed Information on the
Extent and Frequency of Unauthorized Grazing**

Forest Service region	Incidents
Southern	2
Eastern	4
Total	190

Source: GAO analysis of U.S. Forest Service data. | GAO-16-559

Notes: The number of incidents is based on the number of bills issued by the Forest Service for unauthorized grazing and incidents confirmed by Forest Service field offices as incidents in which bills were not issued. Additional incidents may have occurred that were not billed and therefore were not entered in the Forest Service database.

The grazing year used for billing grazing fees is March 1 to February 28.

The 190 incidents identified primarily by bills in the Forest Service’s range management database included charges for different types of unauthorized grazing incidents, excess use (by a permittee), and unauthorized use (by a nonpermittee) (see table 17).² Excess use by permittees was the most common incident type in grazing years 2010 through 2014, accounting for 173—or 91 percent—of the incidents recorded; unauthorized use was 9 percent of the total.

Table 17: U.S. Forest Service Range Program Unauthorized Grazing Incidents by Type and Grazing Year, 2010–2014

Unauthorized grazing type	Grazing year					Total	Percentage
	2010	2011	2012	2013	2014		
Excess use	49	22	47	36	19	173	91%
Unauthorized use	6	1	5	3	2	17	9%
Total	55	23	52	39	21	190	100%

Source: GAO analysis of U.S. Forest Service data. | GAO-16-559

Notes: The number of incidents is based on the number of bills issued by the Forest Service for excess use and unauthorized use, and excess and unauthorized incidents confirmed by Forest Service field offices as those where bills were not issued. Additional incidents may have occurred that were not billed and therefore were not entered in the Forest Service database.

The Forest Service refers to violations by permittees as excess use and by nonpermittees as unauthorized use.

The grazing year used for billing grazing fees is March 1 to February 28.

The Forest Service’s unauthorized grazing bills included charges for excess use and unauthorized use. The Forest Service collected a total of about \$24,000 from these charges in grazing years 2010 through 2014;

²For the purpose of this report, we generally refer to all types of incidents as unauthorized.

nearly \$18,000 from excess use by permittees, and about \$6,000 from unauthorized use by nonpermittees (see table 18). The amount collected includes credits used by livestock owners to pay excess or unauthorized use charges.

Table 18: Amount Collected from the U.S. Forest Service’s Range Program Unauthorized Grazing Charges, by Type, Grazing Years 2010–2014

Unauthorized grazing type	Amount collected
Excess use	\$17,809.79
Unauthorized use	6,147.34
Total	\$23,957.13

Source: GAO analysis of U.S. Forest Service data. | GAO-16-559

Notes: The data include amounts collected from excess use and unauthorized use grazing bills and incidents in which livestock owners used existing credit toward excess or unauthorized use charges. The Forest Service refers to violations by permittees as excess use and by nonpermittees as unauthorized use.

The grazing year used for billing grazing fees is March 1 to February 28.

Forest Service Law Enforcement Data

The Forest Service’s law enforcement database contained records of 428 incidents where formal documentation, such as an incident report (record of observation), warning notice, or violation notice, was prepared by a law enforcement officer and entered into the database in grazing years 2010 through 2014 (see table 19). The number of incidents ranges from 102 in the Intermountain Region to 24 in the Pacific Northwest and Eastern Regions.

Table 19: U.S. Forest Service Law Enforcement Grazing Incidents by Region, Grazing Years 2010–2014

Forest Service region	Incidents
Northern	73
Rocky Mountain	73
Southwestern	45
Intermountain	102
Pacific Southwest	30
Pacific Northwest	24
Southern	57
Eastern	24
Total	428

Source: U.S. Forest Service data. | GAO-16-559

Note: The grazing year used for billing grazing fees is March 1 to February 28.

**Appendix III: Detailed Information on the
Extent and Frequency of Unauthorized Grazing**

From grazing years 2010 through 2014, the year with the most unauthorized grazing incidents recorded in the Forest Service's law enforcement database was 2013; 100 incidents were recorded, or about 23 percent of the 428 total incidents (see table 20).

Table 20: U.S. Forest Service Law Enforcement Unauthorized Grazing Incidents by Type and Grazing Year, 2010–2014

Type of record	Grazing year					Total	Percentage of total
	2010	2011	2012	2013	2014		
Incident report	39	26	45	49	31	190	44%
Warning notice	28	25	33	33	29	148	35%
Violation notice	27	26	11	18	8	90	21%
Total	94	77	89	100	68	428	100%

Source: U.S. Forest Service data. | GAO-16-559

Notes: The Forest Service law enforcement database contains incident reports (records of observation), warning notices, and violation notices prepared by law enforcement officers. The grazing year used for billing grazing fees is March 1 to February 28.

Appendix IV: Comments from the Department of Agriculture



Forest Service
Washington Office

201 14th Street, SW
Washington, DC 20250

File Code: 1410; 2200
Date: JUN 10 2016

Ms. Anne-Marie Fennell
Director, Natural Resources and Environment
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Ms. Fennell:

The U.S. Department of Agriculture, Forest Service appreciates the opportunity to respond to the U.S. Government Accountability Office (GAO) draft report, "Unauthorized Grazing: Action Needed to Improve Tracking and Deterrence Efforts, (GAO-16-559)." The agency generally agrees with the findings in the GAO draft report.

Developing and maintaining collaborative relationships with grazing permittees is critical for the effective management of natural resources and enlisting support from grazing permittees to help manage the valuable resources found on the National Forests and Grasslands for the American public. We have already begun some preliminary work to update our direction to the field units including direction for billing rates for unauthorized grazing in a manner more similar to that used by the Bureau of Land Management. This report will help to sharpen our focus on providing direction for field units on how to resolve unauthorized grazing and document the activity and the solution.

Available resources for natural resource management has declined by 39 percent since 1995. This reduction in available resources does limit the agency's ability to provide compliance monitoring and follow up as necessary on all grazing lands. Given this limitation our practice of solving unauthorized grazing through informal means has worked well for the agency and through this approach we have not found long term situations where permittees had not paid the appropriate fees.

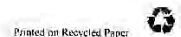
Thank you again for the opportunity to review the draft report. If you have any questions, please contact Thelma Strong, Chief Financial Officer, at 202-205-0429 or tstrong@fs.fed.us.

Sincerely,


THOMAS L. TIDWELL
Chief



Caring for the Land and Serving People



Appendix V: Comments from the Department of the Interior



United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, D.C. 20240

Ms. Anne-Marie Fennell
Director
Natural Resources and Environment
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

JUN 21 2016

Dear Ms. Fennell:

Thank you for the opportunity to review and comment on the Government Accountability Office (GAO) draft report titled, *Unauthorized Grazing: Actions Needed to Improve Tracking and Deterrence Efforts* (GAO-16-559). The Department of the Interior (Department) appreciates the GAO's review of the Bureau of Land Management's (BLM) livestock grazing program regarding detection and resolution of unauthorized livestock grazing.

Rangeland management focuses on maintaining and improving public land health, including the administration of grazing use through permit renewals and compliance inspections. The program has formidable challenges. The BLM currently faces a significant backlog of more than 6,000 grazing permits and leases that remain unprocessed. These backlogged permits represent 34 percent of the total grazing permits and leases nationwide.

Field offices regularly review and prioritize workloads for the rangeland management program. The grazing permit backlog has continued to grow as workload becomes more complex and staffing levels decline. The rangeland management program aims to meet the highest priority workload demands, considering the parallel challenges of an increasing backlog and decreasing staff levels. Prioritizing tasks and finding fresh and effective ways to meet program objectives is an ongoing effort in this era of fiscal limitations.

The GAO issued a total of six recommendations to the BLM and to the U.S. Forest Service to improve the effectiveness of each agency's efforts to track and deter unauthorized grazing. Three of the recommendations were specific to the BLM. Below is a summary of BLM's response to the relevant recommendations and the actions planned to implement them. The Department provides technical comments in separate cover.

Recommendation 1: Amend the regulations on unauthorized grazing use—43 C.F.R. Subpart 4150—to establish a procedure for the informal resolution of violations at the local level, or follow the existing regulations by sending a notice of unauthorized use for each potential violation as provided by 43 C.F.R. § 4150.2(a).

The BLM concurs with this recommendation. The BLM will revise the agency's Unauthorized Grazing Use Handbook to better describe procedures for following the existing regulations. As part of this effort, the BLM will clarify the process for documenting and recording incidents of unauthorized grazing, including those resolved informally (as discussed below in the response to

recommendation 2). In 2006, the U.S. District Court for the District of Idaho enjoined the BLM's most recent effort to revise the grazing regulations and the 1995 regulations have been in effect since the enjoinder was issued. That revision included the incorporation of the GAO's 1990 recommendations. It is not necessary or desirable to attempt another revision of the regulations solely to address this issue.

Recommendation 2: Record all incidents of unauthorized grazing, including those resolved informally.

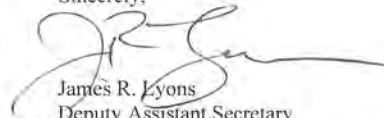
The BLM concurs with this recommendation. As stated above, the BLM will revise the agency's Unauthorized Grazing Use Handbook to clarify the definition of unauthorized grazing. In the Handbook, the BLM will outline the procedures for documenting and recording incidents of unauthorized grazing, including those resolved informally.

Recommendation 3: Revise the agency's Unauthorized Grazing Use Handbook to make it consistent with 43 C.F.R. pt. 4100.

The BLM concurs with this recommendation. The BLM will revise the Unauthorized Grazing Use Handbook to make it consistent with 43 C.F.R. part 4100.

If you have any questions, please contact Kristin Bail, Acting Assistant Director, Resources and Planning, at 202-208-4896, or LaVanna Stevenson, BLM Audit Liaison Officer, at 202-912-7077.

Sincerely,



James R. Lyons
Deputy Assistant Secretary
Land and Minerals Management

Appendix VI: GAO Contact and Staff Acknowledgments

GAO Contact

Anne-Marie Fennell, (202) 512-3841 or fennella@gao.gov

Staff Acknowledgments

In addition to the contact named above, Jeffery D. Malcolm (Assistant Director), Brad C. Dobbins, Karen (Jack) Granberg, and Katherine M. Killebrew made key contributions to this report. Important contributions were also made by Kevin S. Bray, Martin (Greg) Campbell, Elizabeth Martinez, Alana R. Miller, and Cynthia M. Saunders.

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NATIONAL MONUMENTS:

How a Utah designation transformed politics in the West

[Phil Taylor](#), E&E reporter

Published: Wednesday, July 13, 2016



The coal-rich Kaiparowits Plateau looms 1,000 feet above a pinyon and juniper forest in Grand Staircase-Escalante. Photo by Phil Taylor.

ESCALANTE, Utah -- The ceremony marked a pivotal moment for the Bureau of Land Management, for the conservation of the American West and possibly for President Clinton's

re-election.

Sitting at a desk on the South Rim of the Grand Canyon, the president unilaterally protected 1.7 million acres of southern Utah desert, lands so rugged, remote and forbidding that they were the last to be mapped in the Lower 48.

AN E&E SERIES



Grand Staircase two-part series: President Clinton's surprise creation of Grand Staircase-Escalante National Monument 20 years ago still enrages Western Republicans and fuels fights over public lands.

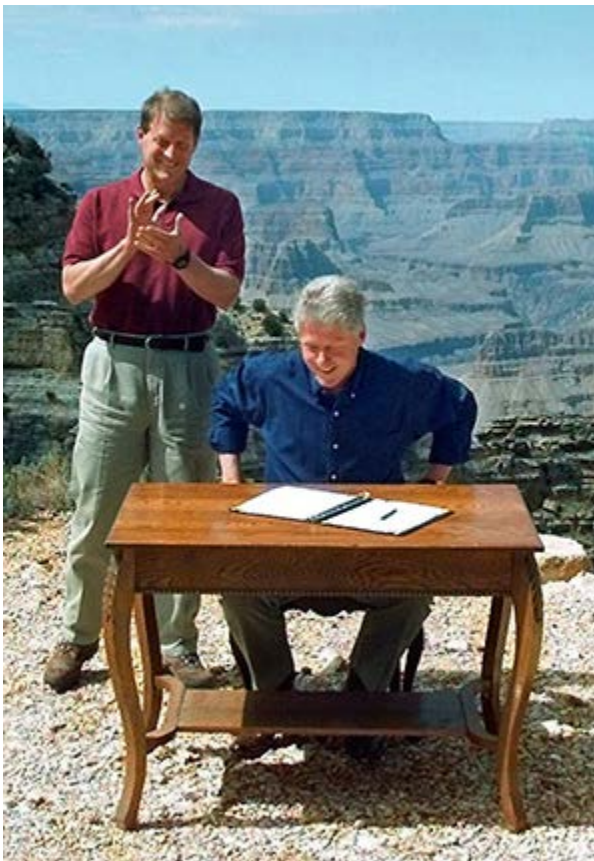
Clinton's [proclamation](#) on Sept. 18, 1996, described the newly established Grand Staircase-Escalante National Monument, with its multihued cliffs, zebra-striped slot canyons and soaring sandstone arches, in striking prose:

"It is a place where one can see how nature shapes human endeavors in the American West, where distance and aridity have been pitted against our dreams and courage."

Nearly 20 years later, Clinton's surprise proclamation continues to shape the politics of public lands from county commissions to the halls of Congress, infuriating many critics. And it's made an indelible mark on BLM, the agency that manages it.

In the history of the 1906 Antiquities Act -- the law that gives presidents unfettered power to create monuments banning drilling, mining and road building -- Clinton's designation was an exhibit in extremes.

Grand Staircase-Escalante remains the largest land-based national monument to be designated. It is 53 times larger than neighboring Bryce Canyon National Park and is bigger than the states of Delaware and Rhode Island combined.



President Clinton, accompanied by Vice President Al Gore, signs the Grand Staircase-Escalante National Monument proclamation. Photo courtesy of AP Images.

It was also the first to be managed by BLM, a multiple-use agency whose oversight of roughly 250 million acres of the West had been largely dominated by extractive uses like oil and gas, mining, and grazing.

Until then, the National Park Service, with its singular mission of preservation, and the Forest Service, with its lofty pines, jagged peaks and alpine lakes, had been the favored stewards of the nation's wilderness, parks, monuments and other scenic lands.

Grand Staircase-Escalante forced the 50-year-old BLM -- long known as the "neglected stepchild" of the wilderness movement -- to reinvent itself.

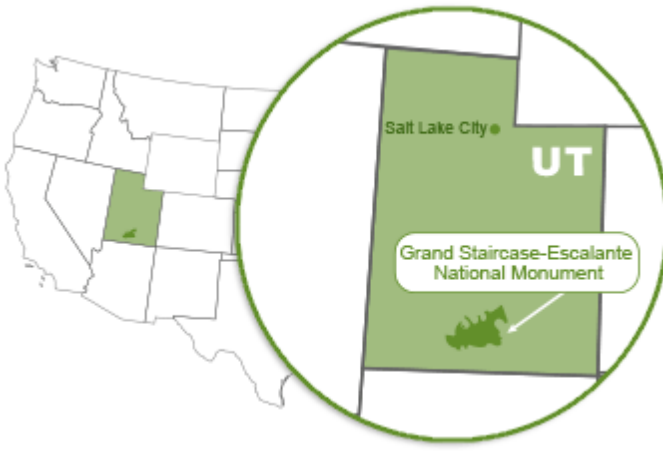
"It was functionally one of the very seminal moments in BLM's conservation evolution," said Ken Rait, director of U.S. public lands for the Pew Charitable Trusts, who was with the Southern Utah Wilderness Alliance in 1996. "I think we're still living that evolution today."

Before leaving office, Clinton would designate 13 more BLM monuments covering 3.5 million acres in Arizona, New Mexico, California, Colorado, Idaho, Oregon and Montana. They laid the foundation for then-Interior Secretary Bruce Babbitt to establish within BLM a National Landscape Conservation System, a new division "to conserve, protect and restore special areas and unique resources."

BLM's NLCS -- now known as the National Conservation Lands -- today contains 32 million acres of national monuments, conservation areas, wilderness, wilderness study areas, wild and

scenic rivers, and other protected sites, and has its own assistant director and budget.

Grand Staircase-Escalante



[+] Map by E&E Publishing.

Yet for many in the West, and particularly the Beehive State, Grand Staircase-Escalante remains a symbol of federal power run amok. Carried out in near-total secrecy, Clinton's designation sowed distrust and resentment among state officials. Critics blasted Clinton for locking up a massive coal deposit and turning the region into a vast playground for Easterners.

"Our founding fathers feared special interests taking away freedom, but today we have another problem," House Natural Resources Chairman Rob Bishop (R-Utah) wrote in an [op-ed](#) last month in the *Boston Herald*. "One man in the Oval Office can lock up land and water from the entire nation with the stroke of a pen. This isn't the original intent of the Antiquities Act."

Clinton's designation -- the first by a president in roughly two decades -- rekindled Republican efforts to reform the Antiquities Act, a push that continues to this day.

With the political wounds still fresh, Grand Staircase-Escalante is also shaping today's debate in southeast Utah over a proposal by American Indians and conservationists for President Obama to designate a 1.9-million-acre Bears Ears National Monument. Administration officials will converge on Utah this Saturday to discuss future management of the Bears Ears area ([Greenwire](#), July 11).

"Grand Staircase is the lens through which many in southern Utah view public lands issues," said Luke Johnson, who served as BLM's deputy director during the George W. Bush administration and is now with the firm Brownstein Hyatt Farber Schreck LLP. "It totally colors this whole debate."

'We can't have mines everywhere'

Clinton preserved one of the most sparsely inhabited places in the Lower 48, a land etched by only a handful of paved roads. The July 1996 edition of *Car and Driver* magazine named Basin Canyon on the monument's Kaiparowits Plateau the "loneliest spot in America."

"Here, within a 30-mile radius, you will find no homes, few footprints and no cable TV," the magazine said. The nearest settlement was Escalante, population 751, followed by the village of Boulder -- the last settlement in the United States to be reached by an automobile, the article said.



Iron-coated "Moqui marbles" are among the geologic oddities found in the monument. Photo by Phil Taylor.

The proclamation preserved meandering desert washes and snaking canyons, where plum-sized iron spheres pop from the sandstone walls like pimples.

Seventy-five million years ago, this parched desert was part of a lush, subtropical, coastal plain occupied by *Tyrannosaurus rex* and velociraptors.

Today, it's full of coal -- 62 billion tons, according to state geologists.

The fuel's buried under the Kaiparowits Plateau, a Rhode Island-size mesa that towers more than 1,000 feet above the Hole-in-the-Rock road, a route blazed by Mormon pioneers on their way to the Colorado River in the late 1800s.

In 1995, Andalex Resources Inc., a Dutch company, was poised to build the Smoky Hollow Mine on federal lands about 20 miles from the tiny town of Big Water, and was awaiting approval from BLM. The underground mine promised to unearth 72 million tons of coal, generate about \$120 million in royalties and bring several hundred jobs to rural Kane County, population 5,169.

But the monument effectively killed it.

It was a massive blow to nearby Kanab, where businesses shut down, restaurants advertised for "Clinton Burgers: 100 Percent Chicken" and schoolchildren released 50 black balloons in mourning, according to news reports.

In his designation [speech](#), Clinton said mining jobs are good jobs and important to the economy, "but we can't have mines everywhere, and we shouldn't have mines that threaten our national treasures."

Advertisement

Utah's elected officials were stunned.

"Part of the problem with that designation is that nobody knew about it," Utah Gov. Gary Herbert (R) said recently. "Our governor found out about it by reading *The Washington Post*."

The monument's size shocked even Clinton's environmentalist allies.

Surely areas within the monument like Canyons of the Escalante, with its green ribbon of cottonwood trees and tributaries of slot canyons, water pockets and geologic domes, seemed worthy of Antiquities Act protections. But the decision to loop in places like the Kaiparowits coal field and the roaded Circle Cliffs, which some environmentalists were privately willing to negotiate away, was seen as a coup.

"Never in a million years did we think we were going to get protections for those lands," said Robert Weinick, an environmentalist who helped start the Southern Utah Wilderness Alliance from his home on the banks of the Escalante River in 1983. "The protection here was so instantaneous and big -- 1.7 million -- it was overwhelming."

'A big, splashy production'

Clinton's move was driven in part by politics, according to White House documents and later interviews with administration officials.

Katie McGinty, who chaired the White House Council on Environmental Quality and is now running for U.S. Senate in Pennsylvania, said in an August 1996 memo that a designation would score political points with Clinton's supporters who were disillusioned after he signed a bill opening forests to salvage logging.

Key events in Grand Staircase-Escalante history

1936 NPS recommends President Franklin Roosevelt designate a 4.5-million-acre Escalante National Monument in southern Utah, but it is defeated by local opposition.

Sept. 18, 1996 President Clinton designates 1.7-million-acre Grand Staircase-Escalante National Monument, the first to be managed by BLM.

October 1996 Kane and Garfield counties illegally grade (improve) roads through wilderness study areas in the monument to assert local control over the lands.

October 1998 Clinton signs the Utah Schools and Land Exchange Act, allowing major swap of state-held monument lands for mineral-rich federal lands and \$50 million.

2000-2001 Clinton designates a dozen more BLM national monuments totaling 2.8 million acres.

Feb. 29, 2000 BLM finalizes first monument management plan, placing new restrictions on motorized access but deferring decisions on grazing.

Nov. 7, 2000 BLM impounds 29 cattle from the monument to protect it from drought, but furious ranchers seize them back from the auction yard.

Late 2001 Kate Cannon, the monument's first manager and a former NPS official, is believed to

be forced out of her job at the behest of Utahans.

Summer 2003 Kane County commissioner and sheriff remove dozens of BLM signs barring ATVs in the monument.

May 2009 Hundreds ride ATVs up the monument's Paria River to protest BLM's closure of the area to OHVs. Nobody is prosecuted.

"It really came out of people around the president who were looking for a big, splashy production at the front end of the '96 election," Babbitt said in an interview last fall for the Southern Utah Oral History Project, an [initiative](#) backed by the Utah Division of State History and BLM to preserve stories associated with the Grand Staircase-Escalante region.

Pollster Dick Morris (who now is advising Republican presidential hopeful Donald Trump) told Clinton then that soccer moms would be a key constituency in his race against former Sen. Bob Dole (R-Kan.) and that they cared deeply about the environment, Babbitt said.

In July 1996, McGinty asked John Leshy, Interior's solicitor at the time, to draft a monument package for the president's consideration, Leshy said.

"Katie's instructions to me on size were rather general," Leshy said in an interview for the oral history project. "The White House wanted to protect a pretty large area to put the industrialization issue to bed, to stop the possibility of coal development."

But what set Grand Staircase-Escalante apart was Babbitt's push to keep it in BLM's hands, a move that infuriated some Park Service officials.

Babbitt got the idea during a 1993 hike through BLM's East Mojave National Scenic Area with BLM California Director Ed Hastey. A bill at the time by Sen. Dianne Feinstein (D-Calif.) would have transferred the desert's scenic valleys, dunes and lava flows from BLM to the Park Service to become the Mojave National Preserve.

Hastey told Babbitt the lands should stay with BLM.

"We'd been managing it for a long time, and there's no question we had the expertise," Hastey told *Greenwire*. Transferring the lands would "impact the morale of our people who worked hard to make that a scenic area."

Babbitt took the message to Feinstein, but the bill was too close to passage to be tweaked.

"The Park Service didn't have the goddamn guts to call it a park, so they called it a preserve," Hastey said. "It wasn't national park quality."

Hastey impressed Babbitt. If every "crown jewel" on the BLM estate was transferred to the Park Service, how could BLM be expected to embrace conservation, Babbitt [recalled](#) asking himself.

Keeping Grand Staircase-Escalante in BLM's care would challenge the stereotype that it only managed the lands nobody wanted and would soften some local concerns over making it a full-fledged park, Clinton officials said. Yet not all conservationists were on board.

"There was, I'd say, in the conservation community excitement for the protection of the place," said Brian O'Donnell, executive director of the Conservation Lands Foundation. "But there were legitimate questions. There were people in the conservation community asking, 'Is BLM

going to be able to do this?"

Once mocked as the "Bureau of Livestock and Mining," BLM had operated much like a state agency, its staff deeply embedded in the local communities, Babbitt said. Clinton's proclamation gave BLM marching orders directly from the White House.

Some BLM employees were as skeptical of Washington, D.C., as Utahans were, Babbitt said.

"BLM lands were long seen as the domain of the extractive industries," said Mike Dombeck, who was BLM's acting director at the time. "What national monuments did is really round out the portfolio of BLM lands."

Growing pains

Pushback was fierce in Kane and Garfield counties, where the prospect of tighter land restrictions inspired sporadic protests and acts of civil disobedience.

Soon after the designation, Babbitt and Clinton were hung in effigy in Escalante, a town that depended heavily on federal lands for grazing and timber. Jerry Meredith, the monument's interim manager and a Utah native, needed a police escort to meet with the town's residents, according to Marsha Holland, a historian who lives in Tropic, Utah.

In October 1996, Kane and Garfield graded dirt roads through the monument's wilderness study areas, asserting local control under a Civil War-era law known as R.S. 2477 and landing the counties in federal court.

Utah counties later sued Clinton, arguing the Antiquities Act violates the Constitution by usurping Congress' power to manage federal lands. They also claimed Clinton had failed to preserve the smallest area of land necessary to protect the monument's resources, as required in the 1906 act, among other claims.

In a ruling several years later, the U.S. District Court for the District of Utah seemed to sympathize with Utah, writing that "despite what may have been the intent of some members of Congress, use of the Antiquities Act has clearly expanded beyond the protection of antiquities."

Yet it ultimately sided with the White House, saying courts have "no authority to determine whether the president abused his discretion." The upshot, according to legal scholars, is that a president's power under the Antiquities Act is virtually unlimited.

In 2000, BLM finalized its first land-use plan for the monument.



Calf Creek, with its green ribbon of cottonwood trees, winds its way toward the Escalante River. Photo by Phil Taylor.

Unlike national parks, with their paved roads, parking lots, lodges and restaurants, Grand Staircase-Escalante was to be managed in its "primitive, frontier state," the plan said. Visitor amenities were limited to "minor facilities such as interpretive kiosks and pullouts" on the periphery of the monument. The existing road network was to remain in its unimproved condition, and cross-country motorized travel was prohibited.

That summer, amid severe drought, BLM asked ranchers to remove their cattle from the monument's withered range so it could heal. When a few ranchers refused, BLM rounded up the cows itself. But ranchers later descended on the auction yard in Sevier County and -- under the sheriff's watch -- took the bovines back.

"We said, 'We're going to put a stop to this,'" said David Johnson, a rancher from Moccasin, Ariz., who kept some of the disputed cows on his ranch just south of the Utah-Arizona border.

It foreshadowed future battles over BLM grazing restrictions, including Cliven Bundy's armed standoff with BLM in Bunkerville, Nev., in April 2014.

Critics said the monument gave environmentalists new influence over BLM decisions. The selection of Kate Cannon, a former Park Service superintendent at Jewel Cave National Monument in South Dakota, as the monument's first permanent manager confirmed their fears.

For better or worse, BLM's culture was changing.

"The BLM was really a good agency, and probably still is to some degree," said Garfield County Commissioner Leland Pollock. "But when the Grand Staircase was created, it was thrown on them. A fish out of water is putting it mildly."

Others say the monument sparked a much-needed paradigm shift.

"Grand Staircase-Escalante has been transformative for both BLM and the manner in which significant lands and the cultural, scientific and natural values they possess are managed and protected," said Carl Rountree, who led BLM's National Conservation Lands until his retirement in late 2014. "For BLM, it provided greater focus on the conservation part of its

multiple-use mission as required by the Federal Land Policy and Management Act -- a part that was sometimes overlooked in carrying out other uses on public land prior to that time."

'Fill that bucket'

The agency's evolution has continued under the Obama administration.

BLM has taken controversial steps to restrict drilling near parks, wildlife habitat and cultural sites; to craft sage grouse protection plans spanning 50 million acres; and to revisit its coal leasing program. Meanwhile, it has inherited several of the national monuments Obama has designated.

Clinton's designations -- driven by Babbitt -- set a template, said Rebecca Watson, who served as Interior assistant secretary overseeing BLM during the George W. Bush administration. Congress followed step in 2009 by making BLM's conservation office permanent, she said.

"Now Interior and willing presidents will 'fill that bucket' by adding new BLM monuments and other protected areas like [areas of critical environmental concern]," she said. "I think there is continuing concern about how much multiple-use lands, upon which public land counties depend, will be put into the protected status of monuments and what role the views of locals and their elected officials can and should play in those federal designations."

Whether Grand Staircase-Escalante helped or harmed southern Utah remains an open debate.

The populations of Kane and Garfield grew from 9,133 in 1990 to 12,278 in 2014, according to federal data compiled by Headwaters Economics. The total number of full- and part-time jobs and personal income nearly doubled during that period.



Zebra Canyon near Escalante gets its name from the streaks in its sandstone walls. Photo by Phil Taylor.

New outfitting companies, lodges and restaurants have sprung up in Escalante, hoping to capitalize on the increased tourist traffic along Utah's Scenic Byway 12.

"The facts don't lie: The data show there has most likely been growth in key economic indicators across both counties," said Rait of the Pew Charitable Trusts. "In contrast to what

Chicken Little said, the sky did not fall."

Yet there are also signs of trouble in Garfield. The percentage of school-aged kids has fallen from 27 to 19 percent since 1990, and school enrollment has fallen by roughly 20 percent. Commissioners last summer declared a "state of emergency," blaming land-use restrictions in the monument.

There's been an inflow of wealthy retirees, empty-nesters and young professionals, a demographic trend that makes some longtime residents uncomfortable.

Asked about it during last month's Western Governors' Association meeting in Jackson, Wyo., Herbert said it's "debatable" whether Kane and Garfield are better or worse off since 1996.

"Some of it is probably good," he said. "But for a lot of people in that rural part of Utah, I think the negative aspects outweigh the positive aspects."

As the Obama administration considers flexing its Antiquities Act muscle to designate a Bears Ears National Monument, Utahans are demanding their voices be heard.

"Let's make sure we work together on it," said Herbert. "We don't want to be blindsided like we were with the Clinton administration."

Conservationists said protecting Grand Staircase-Escalante was an important step in leveraging the recreational value of BLM lands.

Hiking, camping, fishing and other nonmotorized activities on BLM lands generated an estimated \$1.8 billion in 2014 in spending in communities within 50 miles of the recreation sites, according to a new report by Eugene, Ore.-based ECONorthwest and commissioned by Pew ([Greenwire](#), April 1).

"In the long run, people are feeling like this experiment with the BLM has headed in the right direction," O'Donnell said. "But it will take another generation to decide if this was America's next best idea."

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PUBLIC LANDS:

Bishop, Chaffetz up the ante with sweeping Utah bill

[Phil Taylor](#), E&E reporter

Published: Thursday, July 14, 2016

Two Utah congressmen today released a major bill to both conserve and develop millions of acres of public lands in eastern Utah.

The Public Lands Initiative (PLI) by House Natural Resources Chairman Rob Bishop (R) and Oversight and Government Reform Chairman Jason Chaffetz (R) is being touted as an alternative to a bid by American Indians and conservation groups for President Obama to designate a Bears Ears National Monument in Utah's southeast corner.

In all, the 215-page [bill](#) would protect roughly 4.6 million acres in seven eastern Utah counties. It's a 300,000-acre increase from a draft bill Bishop and Chaffetz unveiled in January and covers a landmass roughly equal to New Jersey.

The PLI bill would also designate nearly 1.2 million acres for new recreation and economic development opportunities, while giving Utah consolidated ownership of more than 300,000 acres to allow more efficient development like drilling to raise money for education, according to a [fact sheet](#) on the bill.

The legislation will be a major talking point in Bluff, Utah, on Saturday, where top Obama administration officials are set to host a public meeting to debate future conservation steps for the region.

Bishop, Chaffetz and their supporters have argued that a legislative solution to Utah's thorny public lands fights will carry local support and provide lasting, durable protections and development certainty to a much broader swath of the state than would a presidential monument designation.

"The Public Lands Initiative offers the most comprehensive, viable and legal path forward," Chaffetz said in a statement this morning. "This legislation goes beyond conservation. In the case of Bears Ears, it safeguards access of traditional tribal uses and provides a meaningful seat at the table for tribal interests. Let's give weight to the broad coalition of interests and enable a comprehensive solution to lands disputes that have plagued the West for generations."

The bill drew positive statements -- though not outright endorsements -- today from the Pew Charitable Trusts and the Nature Conservancy's Utah state director.

It was also praised by the Western Energy Alliance, the Utah Farm Bureau, off-highway vehicle group Ride with Respect and San Juan County Commissioner Rebecca Benally, a Navajo who has been an outspoken critic of turning Bears Ears into a national monument.

Yet it took fire from several major regional and national environmental groups, including the Southern Utah Wilderness Alliance, Grand Canyon Trust, Wilderness Society, Natural Resources Defense Council, Sierra Club, National Parks Conservation Association and Conservation Lands Foundation.

"The proposed legislation fails to protect the imperiled cultural resources of Bears Ears, puts important natural and cultural resources at risk to rampant energy development, and undermines protection for priceless red rock Utah lands," the groups said in a joint statement. "The PLI divests Americans of their shared public lands heritage by granting the state of Utah permitting authority over energy development on federal lands, including mandatory grazing on all public lands in eastern Utah, and handing over valuable public lands and resources to the State."

Key changes have been made to the bill since January.

It includes a "revamped" plan to protect 1.4 million acres of the Bears Ears region. That would include an 856,000-acre Bears Ears National Conservation Area, a 434,000-acre Indian Creek National Conservation Area that would wrap around the eastern border of Canyonlands National Park and a wilderness area.

The revised bill also drops some language on wilderness management that conservation groups found objectionable. Provisions for livestock grazing and insect control would mimic precedents Congress established for recently designated wilderness areas including Pine Forest Range in Nevada, Boulder White-Clouds in Idaho and Hermosa Creek in Colorado, the congressmen said.

While the bill would not place limits on the president's use of the Antiquities Act in the seven Utah counties, Bishop is advancing a separate bill that would do just that.

Yet it's unclear whether the stand-alone Antiquities Act bill could pass Congress, given Democrats' stiff defense of the president's monument powers.

Conservationists have said blanket restrictions on such designations are a non-starter. But Bishop and Chaffetz have said their constituents need assurance that Obama or a future president cannot tamper with what they argue is a more collaborative solution for Utah's lands.

Among other changes, the revised PLI bill expands the length of wild and scenic designations

for the Colorado, Dolores and Green rivers to 360 miles, an increase of 60 miles over the draft bill.

Large-scale energy zones have been eliminated, according to the congressmen's fact sheet. "Instead, administrative reforms to the downstream energy permitting process have been included," it says.

More than 1,000 miles of disputed R.S. 2477 roads would be resolved in favor of Utah, it said. Also, Recapture Canyon -- the site where San Juan Commissioner Phil Lyman led an illegal all-terrain vehicle ride in violation of the Bureau of Land Management's prohibition on motorized travel -- would be open to "responsible use, consistent with federal archaeological and cultural resources laws," the fact sheet says. The legislation would approve a right-of-way [request](#) from San Juan County to reopen the canyon to motorized travel.

More than 80,000 acres of wilderness study areas that BLM has previously identified as having roadless qualities would be "hard released," meaning they could no longer be managed as wilderness.

The new bill will receive intense scrutiny from conservationists and the White House as it considers whether to designate a Bears Ears monument.

Bishop appears intent on giving conservationists a tough choice: Support his bill, which protects far more lands and rivers but contains what conservationists see as poison pills on grazing, logging, mineral development and land transfers, or support a smaller national monument (though one that would still be the largest in history), which would leave much of the management decisions up to Obama and future administrations.

In all, the bill would designate more than 2.1 million acres of wilderness -- a higher level of protection than a national monument can afford -- making it one of the largest wilderness bills in history.

The Center for Western Priorities today issued a statement chiding Bishop for waiting until the waning months of Congress in an election year to release the bill.

"This draft bill should have been the starting point over 1,000 days ago when the process began," said CWP Executive Director Jennifer Rokala in a statement. "This all raises one big question: Is Congressman Bishop serious about compromise, or running out the clock? Regardless, he is now under serious time pressure."

Rokala said the revised bill still excludes many areas of the Bears Ears region that tribes want protected. Language in the bill to approve San Juan's proposed right of way through Recapture Canyon "rewards the illegal activities of San Juan County Commissioner Phil Lyman and puts archaeological sites at risk," CWP said.

CWP said it also objects to bill language granting R.S. 2477 claims in remote areas and assurances for continued grazing in conservation areas.

Twitter: [@philipataylor](#) Email: ptaylor@eenews.net

From: Howard, Phillip
To: AJAHSHAN@nrdc.org; action@wildearthguardians.org; tfprell@mtintouch.net; rlemon@mt.gov; tream@wildearthguardians.org; MSaul@biologicaldiversity.org; aweber@biologicaldiversity.org; elly.benson@sierraclub.org; loribmedia@gmail.com; [Tessa Wallace](#); [Dale Manchester](#)
Subject: Hilline Lease Sale Environmental Assessment
Date: Thursday, July 21, 2016 10:49:00 AM

Hello,

Thank you for your comments on the October HiLine Oil and Gas Lease Sale.

This email is to inform you that an update EA has been posted to the BLM eplanning website. The updated draft includes a formal response to comments and edits to the content of the EA based on public comments.

Any protest to the EA must be filled within 30 days (before August 19).

Link to project page:

<https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage&tPageId=80003>

Thank you and let me know if you have any questions.

Phillip Howard
Natural Resource Specialist
Bureau of Land Management
HiLine Division of Oil and Gas
Office: 406-791-7734
Email: phoward@blm.gov

From: Michael Saul
To: BLM_WO_Coal_Program_PEIS_Comments@blm.gov
Subject: Re: Notice of Intent to Prepare a Programmatic Environmental Impact Statement to Review the Federal Coal Program
Date: Thursday, July 28, 2016 4:52:57 PM
Attachments: [Coal PEIS Scoping Comments 7-28-16.pdf](#)

To Whom It May Concern:

Please find attached, in .pdf format, the scoping comments of the Center for Biological Diversity and Utah Physicians for a Healthy Environment on the BLM's Programmatic EIS for the federal coal leasing program.

A separate CD containing exhibits referenced in this scoping letter is being sent via Federal Express.

Please do not hesitate to contact me with any questions regarding these comments.

Sincerely,

Michael A. Saul

Michael Saul

Senior Attorney, Public Lands

Center for Biological Diversity

Denver, CO

phone/text 303-915-8308

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July 28, 2016

U.S. Bureau of Land Management
Coal Programmatic EIS Scoping
Bureau of Land Management
20 M Street, SE
Room 2134LM
Washington, DC 20003

Via electronic mail to: BLM_WO_Coal_Program_PEIS_Comments@blm.gov; Exhibits via Federal Express

RE: Notice of Intent to Prepare a Programmatic Environmental Impact Statement to Review the Federal Coal Program, 81 Fed. Reg. 17,720 (Mar. 30, 2016)

Dear Secretary Jewell, Director Kornze, and Chief Leverette:

On behalf of the Center for Biological Diversity and Utah Physicians for a Healthy Environment, we submit these comments on the Bureau of Land Management's Notice of Intent to Prepare a Programmatic Environmental Impact Statement to Review the Federal Coal Program.¹

The Center for Biological Diversity ("the Center") is a nonprofit environmental organization dedicated to the protection of imperiled species and their habitats through science, education, policy, and environmental law. The Center has over 1.1 million members, supporters and activists dedicated to the conservation of endangered species and wild places, protection of human health and welfare, and combating climate change.

Utah Physicians for a Healthy Environment (UPHE) is a public interest nonprofit organization formed in 2007 whose members include 400 medical professionals within Utah, and another 4,000 supporting members of the public. UPHE is dedicated to protecting the health and well-being of the citizens of Utah by promoting science-based health education and interventions that result in progressive and measurable improvements to the environment.

We commend the Bureau of Land Management on its decision to take a long-overdue comprehensive look at the environmental consequences of the federal coal leasing program. In the over three decades since the last review of this program, two significant developments have occurred that require a thorough reevaluation of the BLM's role as a major coal supplier in the

¹ 81 Fed. Reg. 17,720 (Mar. 30, 2016).

United States and abroad. First, the emergence, through the industry's control of the lease-by-application program, of the Powder River Basin as the nation's largest source of cheap, subbituminous coal has made the BLM into a near-monopoly supplier of thermal coal, and perhaps inadvertently, the country's major facilitator of coal-fired electricity generation. Second, an overwhelming scientific and international consensus has emerged that anthropogenic climate change is real, is happening now, and requires concerted action if its most catastrophic consequences are to be mitigated. After years of denial, the BLM has begun, in some individual rulemaking and leasing reviews, to acknowledge the climate consequences of its coal leasing actions. The Programmatic Environmental Impact Statement process, however, provides the first nationwide opportunity to examine the emissions consequences of federal coal leasing programs and policies, and to begin to take action to bring BLM coal leasing into accord with the nation's stated climate goals and international commitments.

In the Notice of Intent, BLM states:

Many stakeholders highlighted the tension between producing very large quantities of Federal coal while pursuing policies to reduce U.S. GHG emissions substantially, including from coal combustion. They also stated that the current leasing system does not provide a way to systematically consider the climate impacts and costs to the public of Federal coal development, either as a whole, or in the context of particular projects. In addition, they raise concerns that exporting Federal coal, and the associated GHG emissions, undermines our nation's efforts to encourage all countries to contribute to climate change mitigation efforts.²

These scoping comments are intended to assist BLM in meeting its stated goal of identifying and analyzing the climate impacts of the federal program, and the consistency of that program with climate policy. In short, reliable and readily-available tools and methods exist for quantifying GHG emissions limits necessary to meet climate targets, and for identifying the potential greenhouse gas emissions of federal coal deposits potentially available for lease and the comparative emissions consequences of various alternatives. Based on this information, BLM can and must, in order to meet climate targets, consider and adopt an alternative that extends indefinitely the present moratorium on new federal coal leases, and expands the moratorium to all unleased federal coal.

Federal coal already under lease is already exceeds both the quantity that can be burned while maintaining even a 50% change of limiting warming to 2°C, and the anticipated demand for Powder River Basin coal under such a scenario. Facing the realities of physics and international climate commitments requires the BLM to recognize that new federal coal leasing is inconsistent with even the least ambitious climate mitigation targets. The sooner the agency acknowledges this reality, the sooner BLM, other agencies, and coal-producing communities can engage with the necessity of an orderly end to the federal coal program, and a just and sustainable transition for the miners and communities whose labor fueled the twentieth century.

² 81 Fed. Reg. at 17,724-25.

In evaluating the federal coal leasing program as a whole, however, BLM must consider not only energy supply and economic return and the physical and policy limits on greenhouse gas emissions, but also several other significant indirect consequences of the coal leasing program. Federal coal leasing has significant adverse effects on both human health and welfare and on species at risk of extinction (both from the direct impacts of coal mining, transport, combustion, and disposal, and from the federal coal programs' significant contribution to global greenhouse gas emissions).

I. Background

The U.S. Bureau of Land Management (BLM), operating under the authority various federal statutes (including the Mineral Leasing Act, Federal Land Policy and Management Act, the Surface Mining Control and Reclamation Act, the National Environmental Policy Act, and the Endangered Species Act), has the authority to lease publicly-owned coal deposits on approximately 570 million acres of public land to private companies for mining. Under the Mineral Leasing Act, BLM leases federal coal for 20-year periods (with 10-year extensions for producing deposits). Although the process theoretically allows for planned development and competitive bidding, for the past several decades federal coal lease sales has taken place at the behest of the coal industry, with most sales having only a single bidder.

Federal coal leases are primarily, although not exclusively, located in the four western states of Wyoming, Montana, Colorado, and Utah. Approximately 90% of federal coal production comes from the Powder River Basin of Wyoming and Montana, a cheap (easily accessed by surface mining techniques) source of relatively low-sulfur subbituminous coal. As of 2015, 43.5% of U.S. coal produced is from federal leases, and 88% of that coal is from the Powder River Basin. Most federal coal is used in electricity generation. As of 2012, federal coal production was 422 Mt, responsible for an estimated 769 Mt CO₂e in emissions – more than 13 percent of all U.S. fossil fuel GHG emissions, and more than 10 percent of all U.S. GHG emissions. A 2015 review of published government and scientific data estimates the total emissions potential of U.S. federal coal at 20 Gt CO₂e from coal already under lease, and a 212 Gt CO₂e unleased but potentially available for lease. The best available information suggests that coal currently under lease will meet demand for another 25 years (through 2041), under a scenario where the Clean Power Plan (but no other significant climate policies) are implemented. Although some coal companies hope to substitute coal export for declining domestic demand, the necessary infrastructure for expanded coal export does not currently exist. Although response to changes in coal production is contingent on numerous and not fully predictable market, regulatory, and political factors, the best available studies suggest that ending new federal coal leasing would reduce global emissions by 71 Mt CO₂e through 2030 if the Clean Power Plan is implemented, or 238 Mt CO₂e if the CPP is not implemented.

There has been no comprehensive national (or even regional) environmental review of the federal coal leasing program since 1984. Earlier this year, Secretary Jewell announced a partial moratorium on new coal leases and a “programmatic” environmental review of the entire leasing program. The stated purpose of this review is threefold: (1) to determine whether the current leasing program obtains a “fair return” to the taxpayer; (2) to assess the relationship between the coal leasing program and current market conditions; and (3) to address concerns about climate

change. The Secretary's order notes that "[m]any stakeholders highlighted the tension between producing very large quantities of Federal coal while pursuing policies to reduce U.S. GHG emissions substantially, including from coal combustion. Critics also noted that the current leasing system does not provide a way to systematically consider the climate impacts and costs to taxpayers of Federal coal development." Under the National Environmental Policy Act, a programmatic environmental impact statement requires a federal agency to consider (1) alternatives to its proposed course of action, including taking no action, and (2) the consequences of its proposed action and alternatives on the human environment. Despite court rulings making clear that this analysis includes consideration of the climate effects of resulting greenhouse gas emissions, federal agencies have been inconsistent in their treatment of GHG emissions resulting from leasing and infrastructure decisions, frequently dismissing emissions as globally insignificant or assuming perfect substitution of other fossil fuels.

II. NEPA Requirements for a Programmatic Environmental Impact Statement

The National Environmental Policy Act (NEPA) requires that federal agencies take a hard look at the environmental consequences of a major federal action before taking that action. *Baltimore Gas & Elec. Co. v. Natural Res. Def. Council, Inc.*, 462 U.S. 87, 97 (1983). To that end, NEPA requires every federal agency to:

include in every recommendation ... on ... major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on (i) the environmental impact of the proposed action, (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented, (iii) alternatives to the proposed action, (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented. 42 U.S.C. § 4332(2)(C).

NEPA requires federal agencies to prepare an EIS for any major federal action significantly affecting the quality of the human environment. 42 U.S.C. § 4332(2)(C)(i); *Sierra Club*, 777 F. Supp. 2d at 47. This requirement furthers NEPA's twin aims of ensuring that an agency consider every significant aspect of the environmental impact of a proposed action, and inform the public that it has indeed considered environmental concerns in its decision making process. *WildEarth Guardians v. Jewell*, 738 F.3d 298, 302 (D.C. Cir. 2013)(quoting *Baltimore Gas*, 462 U.S. at 97).

To determine whether the impacts of an action are significant, Council on Environmental Quality (CEQ) regulations identify two factors: context and intensity. 40 C.F.R. § 1508.27(a)-(b). Context refers to an action's significance in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality, considering short- and long-term effects. *Id.* § 1508.27(a). Intensity refers to the severity of impact, based on a number of possible factors, including effects on public health or safety, cumulatively significant environmental impacts that are reasonable to anticipate, and the degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration. *Id.* § 1508.27(b)(2), (6), (7).

As discussed herein, coal's life-cycle impacts are significant based on the intensity of effects on public health and safety, and the cumulative nature of the effects, particularly on coal mining, transport and export communities. Other agencies have recognized that the impacts of coal mining and coal transport are sufficiently significant to require preparation of an EIS. See e.g., *WildEarth Guardians*, 738 F.3d at 311 (Department of Interior prepared EIS for coal mining leases, where impacts included local air pollution, including ozone and nitrous oxides); *Natural Res. Def. Council, Inc. v. Jamison*, 815 F. Supp. 454, 457 (D.D.C. 1992) (Department of Interior prepares EIS to assess impact of leasing proposed sites for coal mining); US Army Corps of Engineers, Notice of Amendment to the Intent To Prepare an Environmental Impact Statement (EIS) for the Millennium Bulk Terminals—Longview Shipping Facility Project, 78 Fed. Reg. 54873 (Sept. 6, 2013) (EIS to be prepared due to potentially significant impacts related to proposed construction and operation of a facility to ship coal, which included air and water quality, noise, traffic, and recreation).

In addition to the significance of impact based on health and safety effects, the cumulative impact of coal's life-cycle processes is significant. See 40 C.F.R. §1508.27(b)(7). CEQ regulations define cumulative impact as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. *Id.* at 1508.7. When an agency's action involves an increase in existing impacts, the relevant environmental impact is the cumulative impact, not merely the incremental difference between the new and existing level of activity. See *Grand Canyon Trust v. FAA*, 290 F.3d 339, 342 (D.C. Cir. 2002) (EA should have considered cumulative impact of new airport, and not merely incremental difference between noise associated with new airport and noise associated with existing airport.). The cumulative impacts of coal's life-cycle effects on human health and the environment are significant and therefore, BLM is obligated to consider the effects of those impacts, “incorporating the effects of other projects into the background data base of the project at issue.” *Grand Canyon Trust*, 290 F.3d at 342 (citation omitted). Finally, recognizing the potentially significant public health impacts of the life-cycle of coal would set a precedent that would require BLM to apply NEPA to all future impacts and activities associated with federal coal, both upstream and downstream. Clearly, the health impacts of coal from cradle to grave are significant, as discussed at length in the following sections. Therefore, BLM has a responsibility within the scope of their NEPA authority to examine these impacts thoroughly and provide for ample public review.

Meaningful consideration of greenhouse gas emissions is clearly within the scope of required NEPA review.³ As the Ninth Circuit has held, in the context of fuel economy standard rules:

The impact of greenhouse gas emissions on climate change is precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct. Any given rule setting a CAFE standard might have an “individually minor” effect on the environment, but these rules are “collectively significant actions taking place over a period of time” (quoting 40 C.F.R. § 1508.7)⁴

³ *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008);

⁴ *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1216 (9th Cir. 2008).

Whether or not any given lease sale is “individually minor” (a questionable assertion, given that single sales such as the Wright Area sales can implicate 2 billion tons of coal), it is beyond dispute that the federal coal program as a whole implicates a significant chunk of national and global greenhouse gas emissions – at current rates approximately 14% of U.S. fossil fuel emissions,⁵ 10% of U.S. total GHG emissions,⁶ and 1.6% of total global GHG emissions.⁷ The courts have ruled that agency consideration indirect GHG emissions resulting from agency policy, regulatory, and leasing decisions cannot ignore the impact of decisions regarding coal supply.⁸

III. Preventing Catastrophic Climate Change Requires Ending Federal Coal Leasing

Over 65 eminent climate scientists agree: the vast majority of known coal in the United States must stay in the ground if the federal coal program is to be consistent with national climate objectives and be protective of public health, welfare, and biodiversity.⁹ As set forth below, the science is clear that (a) climate change is a serious and imminent threat to health, welfare, and biodiversity, (b) mitigating the worst effects of climate change requires rapid implementation of limits not just on rates of greenhouse gas emission, but on total greenhouse gas loads to the atmosphere, and (c) continued federal coal leasing is inconsistent with any reasonable path to mitigating greenhouse gas emissions to the degree necessary to protect health, welfare, and biodiversity.

A. Climate Change Poses a Well-Documented Threat to the United States and the World

On December 12, 2015, nearly 200 governments, including the United States, agreed to the commitments enumerated in the Paris Agreement to “strengthen the global response to the threat of climate change”¹⁰ The Paris Agreement codified the international consensus that the climate crisis is an urgent threat to human societies and the planet, with the parties recognizing that:

Climate change represents an urgent and potentially irreversible threat to human societies and the planet and thus requires the widest possible cooperation by all

⁵ Climate Accountability Institute. 2015. Memorandum from Richard Heede to Friends of The Earth and Center for Biological Diversity, at http://webiva-downton.s3.amazonaws.com/877/3a/7/5721/Exhibit_1-1_ONRR_ProdEmissions_Heede_7May15.pdf.

⁶ Stratus Consulting, Cutting Greenhouse Gas From Fossil-Fuel Extraction on Federal Lands and Waters 5 (2015), citing U.S. Environmental Protection Agency, “National Greenhouse Gas Emissions Data”, available at <http://www.epa.gov/climatechange/ghghemissions/usinventoryreport.html>;

⁷ Boden, T.A., Marland, G., and Andres, R.J. (2015). [National CO2 Emissions from Fossil-Fuel Burning, Cement Manufacture, and Gas Flaring: 1751-2011](#), Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy, doi 10.3334/CDIAC/00001_V2015.

⁸ See *Mid States Coal. For Progress v. Surface Transp. Bd.*, 345 F.3d 520, 532, 550 (8th Cir. 2003); *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F.Supp. 3d 1174, 1197-98 (D.Colo. 2014)

⁹ Ken Caldeira et al., Scientists support ending leasing on public lands to protect the climate, public health, and biodiversity (July 27, 2016), http://www.biologicaldiversity.org/programs/public_lands/energy/dirty_energy_development/coal/pdfs/16_7_26_Scientist_sign-on_letter_Coal_PEIS.pdf

¹⁰ Paris Agreement, Art. 2(1).

countries, and their participation in an effective and appropriate international response, with a view to accelerating the reduction of global greenhouse gas emissions (emphasis added).¹¹

Numerous authoritative scientific assessments have established that climate change is causing grave harms to human society and natural systems, and these threats are becoming increasingly dangerous. The Intergovernmental Panel on Climate Change, in its 2014 Fifth Assessment Report, stated that: “[w]arming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased” and that “[r]ecent climate changes have had widespread impacts on human and natural systems.”¹²

The United States’ 2014 Third National Climate Assessment, prepared by a panel of non-governmental experts and reviewed by the National Academy of Sciences and multiple federal agencies similarly stated that “[t]hat the planet has warmed is ‘unequivocal,’ and is corroborated through multiple lines of evidence, as is the conclusion that the causes are very likely human in origin”¹³ and “[i]mpacts related to climate change are already evident in many regions and are expected to become increasingly disruptive across the nation throughout this century and beyond.”¹⁴ The United States National Research Council similarly concluded that: “[c]limate change is occurring, is caused largely by human activities, and poses significant risks for—and in many cases is already affecting—a broad range of human and natural systems.”¹⁵

The IPCC and National Climate Assessment further decisively recognize the dominant role of fossil fuels in driving climate change:

While scientists continue to refine projections of the future, observations unequivocally show that climate is changing and that the warming of the past 50 years is primarily due to human-induced emissions of heat-trapping gases. These emissions come mainly from burning coal, oil, and gas, with additional contributions from forest clearing and some agricultural practices.¹⁶

¹¹ Paris Agreement, Decision, Recitals.

¹² IPCC AR5 Synthesis Report at 2.

¹³ Melillo, Jerry M., Climate Change Impacts in the United States: The Third National Climate Assessment, Terese (T.C.) Richmond, and Gary W. Yohe, Eds., U.S. Global Change Research Program, doi:10.7930/J0Z31WJ2 (2014) (Third National Climate Assessment) at 61 (quoting IPCC, 2007: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, S. Solomon, D. Qin, M. Manning, Z. Chen, M. Marquis, K. B. Averyt, M. Tignor, and H. L. Miller, Eds., Cambridge University Press, 1-18.).

¹⁴ Third National Climate Assessment at 10.

¹⁵ National Research Council, Advancing the Science of Climate Change (2010), available at www.nap.edu. (“Advancing the Science of Climate Change”) at 2.

¹⁶ Third National Climate Assessment at 2.

CO₂ emissions from fossil fuel combustion and industrial processes contributed about 78% to the total GHG emission increase between 1970 and 2010, with a contribution of similar percentage over the 2000–2010 period (*high confidence*).¹⁷

These impacts emanating from the extraction and combustion of fossil fuels are harming the United States in myriad ways, with the impacts certain to worsen over the coming decades absent deep reductions in domestic and global GHG emissions. EPA recognized these threats in its 2009 Final Endangerment Finding under Clean Air Act Section 202(a), concluding that greenhouse gases from fossil fuel combustion endanger public health and welfare: “the body of scientific evidence compellingly supports [the] finding” that “greenhouse gases in the atmosphere may reasonably be anticipated both to endanger public health and to endanger public welfare.”¹⁸ In finding that climate change endangers public health and welfare, EPA has acknowledged the overwhelming evidence of the documented and projected effects of climate change upon the nation:

Effects on air quality: “The evidence concerning adverse air quality impacts provides strong and clear support for an endangerment finding. Increases in ambient ozone are expected to occur over broad areas of the country, and they are expected to increase serious adverse health effects in large population areas that are and may continue to be in nonattainment. The evaluation of the potential risks associated with increases in ozone in attainment areas also supports such a finding.”¹⁹

Effects on health from increased temperatures: “The impact on mortality and morbidity associated with increases in average temperatures, which increase the likelihood of heat waves, also provides support for a public health endangerment finding.”²⁰

Increased chance of extreme weather events: “The evidence concerning how human induced climate change may alter extreme weather events also clearly supports a finding of endangerment, given the serious adverse impacts that can result from such events and the increase in risk, even if small, of the occurrence and intensity of events such as hurricanes and floods. Additionally, public health is expected to be adversely affected by an increase in the severity of coastal storm events due to rising sea levels.”²¹

Impacts to water resources: “Water resources across large areas of the country are at serious risk from climate change, with effects on water supplies, water quality, and adverse effects from extreme events such as floods and droughts. Even areas of the country where an increase in water flow is projected could face water resource problems from the supply and water quality problems associated with temperature increases and precipitation variability, as well as

¹⁷ IPCC AR5 Synthesis Report at 46.

¹⁸ Final Endangerment Finding, 74 Fed. Reg. at 66,497.

¹⁹ Final Endangerment Finding, 74 Fed. Reg. at 66,497

²⁰ Final Endangerment Finding, 74 Fed. Reg. at 66,497

²¹ Final Endangerment Finding at 66,497-98.

the increased risk of serious adverse effects from extreme events, such as floods and drought. The severity of risks and impacts is likely to increase over time with accumulating greenhouse gas concentrations and associated temperature increases.”²²

Impacts from sea level rise: “The most serious potential adverse effects are the increased risk of storm surge and flooding in coastal areas from sea level rise and more intense storms. Observed sea level rise is already increasing the risk of storm surge and flooding in some coastal areas. The conclusion in the assessment literature that there is the potential for hurricanes to become more intense (and even some evidence that Atlantic hurricanes have already become more intense) reinforces the judgment that coastal communities are now endangered by human-induced climate change, and may face substantially greater risk in the future. Even if there is a low probability of raising the destructive power of hurricanes, this threat is enough to support a finding that coastal communities are endangered by greenhouse gas air pollution. In addition, coastal areas face other adverse impacts from sea level rise such as land loss due to inundation, erosion, wetland submergence, and habitat loss. The increased risk associated with these adverse impacts also endangers public welfare, with an increasing risk of greater adverse impacts in the future.”²³

Impacts to energy, infrastructure, and settlements: “Changes in extreme weather events threaten energy, transportation, and water resource infrastructure. Vulnerabilities of industry, infrastructure, and settlements to climate change are generally greater in high-risk locations, particularly coastal and riverine areas, and areas whose economies are closely linked with climate-sensitive resources. Climate change will likely interact with and possibly exacerbate ongoing environmental change and environmental pressures in settlements, particularly in Alaska where indigenous communities are facing major environmental and cultural impacts on their historic lifestyles.”²⁴

Impacts to wildlife: “Over the 21st century, changes in climate will cause some species to shift north and to higher elevations and fundamentally rearrange U.S. ecosystems. Differential capacities for range shifts and constraints from development, habitat fragmentation, invasive species, and broken ecological connections will likely alter ecosystem structure, function, and services, leading to predominantly negative consequences for biodiversity and the provision of ecosystem goods and services.”²⁵

In addition to these acknowledged impacts on public health and welfare generally, climate change is causing and will continue to cause serious impacts on natural resources that the

²² Final Endangerment Finding at 66,498.

²³ Final Endangerment Finding at 66,498

²⁴ Final Endangerment Finding at 66,498

²⁵ Final Endangerment Finding at 66,498 *see also* Third National Climate Assessment at 195-219.

Department of Interior is specifically charged with safeguarding.²⁶

Impacts to Public Lands: Climate change is causing and will continue to cause specific impacts to public lands and resources. Although public lands provide a variety of public benefits, one recent Forest Service attempt at quantification estimates the public land ecosystem services at risk from climate change at between \$14.5 and \$36.1 billion annually.²⁷ In addition to the general loss of public land resources, irreplaceable species and aesthetic and recreational treasures are at risk of permanent destruction. High temperatures are causing loss of glaciers in Glacier National Park; the Park's glaciers are expected to disappear entirely by 2030, with ensuing warming of stream temperatures and adverse effects to aquatic ecosystems.²⁸ With effects of warming more pronounced at higher latitudes, tundra ecosystems on Alaska public lands face serious declines, with potentially serious additional climate feedbacks from melting permafrost.²⁹ In Florida, the Everglades face severe ecosystem disruption from already-occurring saltwater incursion.³⁰ Sea level rise will further damage freshwater ecosystems and the endangered species that rely on them.

Impacts to Biodiversity and Ecosystems: Across the United States ecosystems and biodiversity, including those on public lands, are directly under siege from climate change—leading to the loss of iconic species and landscapes, negative effects on food chains, disrupted migrations, and the degradation of whole ecosystems.³¹ Specifically, scientific evidence shows that climate change is already causing changes in distribution, phenology, physiology, genetics, species interactions, ecosystem services, demographic rates, and population viability: many animals and plants are moving poleward and upward in elevation, shifting their timing of breeding and migration, and experiencing population declines and extirpations.³² Because climate change is occurring at an unprecedented pace with multiple synergistic impacts, climate change is predicted to result in catastrophic species losses during this century. For example, the IPCC concluded that 20% to 30% of plant and animal species will face an increased risk of extinction if global average temperature rise exceeds 1.5°C to 2.5°C relative to 1980-1999, with an increased risk of extinction for up to 70% of species worldwide if global average temperature

²⁶ See Federal Land Policy and Management Act of 1976, 43 U.S.C. §§ 1701(a)(8), 1712(c)(1); Multiple-Use Sustained Yield Act of 1960, 16 U.S.C. § 528; National Environmental Policy Act of 1969, 42 U.S.C. §§ 4331-4332.

²⁷ Esposito, Valerie *et al.*, Climate Change and Ecosystem Services: The Contribution and Impacts on Federal Public Lands in the United States, USDA Forest Service Proceedings RMRS-P-64 at 155-164 (2011).

²⁸ U.S. Environmental Protection Agency, Climate Change and Public Lands: National Parks at Risk (1999).

²⁹ See National Climate Assessment at 48; MacDougall, A. H., *et al.*, Significant contribution to climate warming from the permafrost carbon feedback, 5 Nature Geoscience 719-721 (2012), doi:10.1038/ngeo1573.

³⁰ See National Climate Assessment at 592; Foti, R., *Met al.*, Signs of critical transition in the Everglades wetlands in response to climate and anthropogenic changes, 110 Proceedings of the National Academy of Sciences 6296-6300, (2013), doi:10.1073/pnas.1302558110.

³¹ National Climate Assessment at 13.

³² See Parmesan, C. and G. Yohe, A globally coherent fingerprint of climate change impacts across natural systems, 421 Nature 37 (2003); Root, T. *et al.*, Fingerprints of global warming on wild animals and plants, 421 Nature 57 (2003); Chen, I. *et al.*, Rapid range shifts of species associated with high levels of climate warming, 333 Science 1024 (2011).

exceeds 3.5°C relative to 1980-1999.³³

As greenhouse gas emissions and the resulting harms from climate change grow, the Fish and Wildlife Service and National Marine Fisheries Service are increasingly recognizing climate change as a significant threat to listed species. The Services determined that climate change is a threat (and a listing factor) in the listing rules for the vast majority of species listed as threatened and endangered in recent years. Our analysis of listing rules found that climate change was determined to be a threat for 96% and 91% of all species listed in 2012 and 2013, respectively.

In recent years, several species have been listed primarily because of climate change threats resulting from continued greenhouse gas emissions, including the polar bear in 2008, the bearded seal and ringed seal in 2012, and 20 coral species in 2014. The best-available science has concluded that the survival and recovery of these climate-vulnerable species depends on a return to lower atmospheric CO₂ concentrations than the present level of 400 ppm. As such, the massive greenhouse gas emissions stemming from the federal coal program are clearly not consistent with the survival and recovery of these species.

Corals: For example, NMFS' 2015 Final Recovery Plan for Elkhorn and Staghorn Coral includes a recovery criterion with specific targets for ocean temperature and ocean acidification conditions that must be achieved for these corals to survive and recover. As noted in the Final Recovery Plan, meeting this criterion is consistent with a return to an atmospheric CO₂ concentration of less than 350 ppm, as concluded by numerous scientific studies that have examined coral species viability in response to ocean warming and ocean acidification. Recognizing the responsibility of all federal agencies to promote listed species' conservation, the Final Recovery Plan further includes a recovery criterion calling for the adoption of "adequate domestic and international regulations and agreements" to abate threats from increasing atmospheric CO₂ concentrations. The plan also includes a recovery action to "develop and implement U.S. and international measures to reduce atmospheric CO₂ concentrations to a level appropriate for coral recovery."

Polar Bears: Similarly, the 2015 Draft Polar Bear Conservation Plan acknowledges that the polar bear cannot be recovered without decisive action to mitigate the primary threat to the species—greenhouse gas ("GHG") emissions driving sea-ice loss:

³³ IPCC, *Climate Change 2007: Synthesis Report*. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change 48 [Core Writing Team, Pachauri, R.K and Reisinger, A.(eds.)] (2007). Other studies have predicted similarly severe losses: 15%-37% of the world's plants and animals committed to extinction by 2050 under a mid-level emissions scenario, *see* Thomas *et al.*, Extinction risk from climate change, 427 *Nature* 145 (2004)); the potential extinction of 10% to 14% of species by 2100 if climate change continues unabated, *see* Maclean, I. M. D. and R. J. Wilson, Recent ecological responses to climate change support predictions of high extinction risk, 108 *Proc. Natl. Acad. Sci.* 12337-12342 (2011); and the loss of more than half of the present climatic range for 58% of plants and 35% of animals by the 2080s under the current emissions pathway, in a sample of 48,786 species, *see* Warren, R. J. *et al.*, Increasing Impacts of Climate Change Upon Ecosystems with Increasing Global Mean Temperature Rise, 106 *Climatic Change* 141 (2011).

The single most important step for polar bear conservation is decisive action to address global warming (Amstrup et al. 2010, Atwood et al. 2015), which is driven primarily by increasing atmospheric concentrations of greenhouse gases. Short of actions that effectively addresses the primary cause of diminishing sea ice, it is unlikely that polar bears will be recovered.

Loggerhead sea turtles: Other marine species are also at risk from numerous consequences of GHG emissions and ensuing ocean temperature increase, sea level rise, disruption of ocean currents, and extreme weather events. The 2011 listing rule for the loggerhead sea turtle found climate change and sea level rise to be a significant threat to multiple distinct population segments of the loggerhead sea turtle, including the North and South Pacific populations.³⁴ The Services found that “Similar to other areas of the world, climate change and sea level rise have the potential to impact loggerheads in the North Pacific Ocean.”³⁵ This includes beach erosion and loss from rising sea levels, skewed hatchling sex ratios from rising beach incubation temperatures, and abrupt disruption of ocean currents used for natural dispersal during the complex life cycle (Hawkes *et al.*, 2009; Poloczanska *et al.*, 2009). Scientific reviews of the impacts of climate change on sea turtles confirm that climate change poses significant threats to the loggerhead (Fuentes et al. 2009, Hawkes et al. 2009, Witt et al. 2010). Hawkes et al. (2009) concluded that “[o]verall, climate change could supersede current documented threats posed to marine turtle populations” including bycatch, habitat destruction, and pollution (p.146). Fuentes et al. (2010) highlighted that sea turtles will be affected simultaneously by changes in multiple climatic processes which will create amplifying effects, especially in combination with other threats. Furthermore, many researchers have cautioned that sea turtles are especially vulnerable to climate change because they are slow to recover from disturbances due to their life history characteristics. The best available science on the impacts of observed and projected climate change on loggerhead sea turtles, reviewed below, clearly indicates that climate change—including sea level rise, increasing sand temperatures, increasing storm activity, rising ocean temperatures and changes in circulation pattern, and ocean acidification—is a significant threat to the survival of the species.

Monarch Butterfly: The Monarch butterfly, due to its narrow thermal requirements and specific microhabitat requirements, is also at exceptional risk due to climate change:³⁶

The monarch is threatened by several other factors including global climate change, severe weather events, pesticides, and the spread of invasive species. Unfavorable weather conditions have been identified as a primary factor contributing to the recent drastic declines in monarch populations. Weather that is

³⁴ Fish and Wildlife Service, Determination of Nine Distinct Population Segments of Loggerhead Sea Turtles and Endangered or Threatened, 76 Fed. Reg. 58,868, 58,909 (Sept. 22, 2011).

³⁵ *Id.*

³⁶ Center for Biological Diversity, PETITION TO PROTECT THE MONARCH BUTTERFLY (*DANAUS PLEXIPPUS LEXIPPUS*) UNDER THE ENDANGERED SPECIES ACT.

too hot or too cold at critical times in monarch development can cause massive mortality of caterpillars and adults. A single winter storm event in Mexican overwintering habitat in 2002 killed an estimated 450-500 million monarchs. This high death toll from a single storm event is particularly staggering given that the entire monarch population now numbers only about 35 million butterflies. Because of their narrow thermal tolerance and specific microhabitat requirements, climate change threatens monarchs in their summer and winter ranges. The threat from climate change in the monarch's overwintering habitat in Mexico is so dire that monarchs may no longer occur in the Monarch Butterfly Biosphere Reserve by the end of the century due to climatic changes. The monarch's summer breeding habitat in the United States is also predicted to become too hot in many areas for monarch's to be able to successfully reproduce.³⁷

Colorado River listed fishes (Colorado pikeminnow, bonytail chub, humpback chub, and razorback sucker): Anthropogenic climate change is profoundly impacting the Colorado River in ways that are altering temperature, streamflow, and the hydrologic cycle. As detailed below, changes observed to date include rising temperatures, earlier snowmelt and streamflow, decreasing snowpack, and declining runoff and streamflow. Modeling studies project that these changes will only worsen, including continued declines in streamflow and intensification of drought. Climate change is likely to have significant effects on the endangered fish and the Colorado River ecosystem.³⁸

Impacts from Algal Blooms: Toxic algal blooms are a public health menace and they have an obvious and distinct relationship with global warming.³⁹ Many types of algae release toxic compounds, or harbor other deadly bacteria, that can have a wide range of health consequences, especially neurotoxicity, and can even be fatal if swallowed.⁴⁰ The public health threat is enhanced because the toxicity of the blooms is not always proportional to their visibility.⁴¹ In fact, the blooms can be dilute and inconspicuous and still highly toxic to wildlife and human health.⁴²

³⁷ *Id.* at 10-11.

³⁸ Impacts of Climate Change on the Colorado River Basin, Shaye Wolf, Ph.D., Climate Science Director, Center for Biological Diversity (March 10, 2016).

³⁹ U.S. Environmental Protection Agency, *Impacts of Climate Change on the Occurrence of Harmful Algal Blooms*, EPA Office of Water 820-S-13-001 (May 2013), found at <https://www.epa.gov/sites/production/files/documents/climatehabs.pdf>.

⁴⁰ Anderson, M. Donald et al., Estimated Annual Economic Impacts from Harmful Algal Blooms (HABs) in the United States, Woods Hole Oceanographic Institution (September 2000) pg. 5-6, found at <https://www.whoi.edu/files/server.do?id=24159&pt=10&p=19132>.

⁴¹ *Id.*

⁴² *Id.*

Algae feed on nutrients like nitrogen and phosphorus whose presence in water may be the result of reckless agricultural practices, inadequate regulations, and leaky sewage systems.⁴³ But warmer temperatures ignite the process.⁴⁴ In fact, climate change promotes the growth and dominance of harmful algal blooms through a cascade of multiple mechanisms, including: warmer water temperatures, changes in rainfall patterns, increases in the acidity of ocean waters, and sea level rise.⁴⁵

Algae need carbon dioxide to survive. Higher levels of carbon dioxide in the air and water accelerate algae growth, especially toxic blue-green algae which can float to the water's surface, depriving other marine life of oxygen and sunlight.⁴⁶ When global warming unleashes heavy rainfall and flooding more nitrogen/phosphorus pollution from farms and sewage seeps into waterways, serving up the nutrient banquet for the algae to thrive on.⁴⁷ Where global warming leads to drought, the salinity of fresh water bodies is increased.⁴⁸ This can cause marine algae to invade freshwater ecosystems. In the southwestern and south central United States, toxic marine algae have been killing fish in freshwater lakes since 2000.⁴⁹

Warmer temperatures inhibit mixing of water layers, allowing stagnation of warmer layers near the surface, promoting thicker and faster algae growth.⁵⁰ Algal blooms actually increase water surface temperatures by absorbing more sunlight, creating a feed back spiral of more blooms, absorbing more sunlight, warming the water further, and promoting more blooms.⁵¹

Warmer temperatures reduce the viscosity of water, increasing the speed at which small aquatic organisms can vertically migrate.⁵² This makes it easier for the small, toxic, cyanobacteria to float to the surface to form the dangerous blooms.⁵³

While algal blooms are not new, there has been a worldwide increase in their frequency, severity and geographic distribution, in concert with the rise in global temperatures.⁵⁴ Significant outbreaks have occurred in the last few years in Ohio, Florida, New York, and Utah. Last year, a mass of record breaking warm water triggered a bloom that extended from southern California

⁴³ U.S. Environmental Protection Agency, *Nutrient Pollution Sources and Solutions*, EPA Office of Water (January 2016), found at <https://www.epa.gov/nutrientpollution/sources-and-solutions>.

⁴⁴ See generally EPA, *Impacts of Climate Change*.

⁴⁵ See *Id.*

⁴⁶ See *Id.*

⁴⁷ See *Id.*

⁴⁸ See *Id.*

⁴⁹ See Anderson, *Estimated Annual Economic Impacts*, at 24.

⁵⁰ See generally EPA, *Impacts of Climate Change*.

⁵¹ See *Id.*

⁵² See *Id.*

⁵³ See *Id.*

⁵⁴ See *Id.*

to Alaska, damaging the entire marine food web throughout the West Coast, especially the crab industry.⁵⁵ The bloom was 40 miles wide and 650 ft deep in some places.⁵⁶ Marine scientists said last year's toxic algal bloom was "unprecedented" and "diagnostic of what we can expect more of in the future."⁵⁷ The EPA notes that these blooms are now a serious environmental problem plaguing all 50 states, not just those on the coasts.⁵⁸

The blooms also have a significant economic impact. In 2000, the Woods Hole Oceanographic Institution estimated that the annual economic cost to the US economy at that time was about \$450 million dollars.⁵⁹ That figure would be markedly increased today.

Impacts to oceans: Oceans have absorbed the vast bulk of warming to date, and will continue to suffer increasingly severe impacts on temperature, acidity, circulation, and marine ecosystems from climate change.⁶⁰ A recent survey of science regarding climate change impacts to the world's oceans finds that:

Marine ecosystems are centrally important to the biology of the planet, yet a comprehensive understanding of how anthropogenic climate change is affecting them has been poorly developed. Recent studies indicate that rapidly rising greenhouse gas concentrations are driving ocean systems toward conditions not seen for millions of years, with an associated risk of fundamental and irreversible ecological transformation. The impacts of anthropogenic climate change so far include decreased ocean productivity, altered food web dynamics, reduced abundance of habitat-forming species, shifting species distributions, and a greater incidence of disease. Although there is considerable uncertainty about the spatial and temporal details, climate change is clearly and fundamentally altering ocean ecosystems. Further change will continue to create enormous challenges and costs for societies worldwide, particularly those in developing countries.⁶¹

The IPCC's Fifth Assessment Report on Climate Change Impacts, Adaptation, and Vulnerability similarly summarizes the state of scientific research on foreseeable impacts to marine systems and reaches the following conclusions:

Due to projected climate change by the mid 21st century and beyond, global marine-species redistribution and marine-biodiversity reduction in sensitive regions will challenge the sustained provision of fisheries productivity and

⁵⁵ Mapes, Lynda V., *Toxic Algae Creating Deep Trouble on West Coast*, The Seattle Times, November 15th, 2015, <http://www.seattletimes.com/seattle-news/environment/toxic-algae-creating-deep-trouble-on-west-coast/> (last visited July 28th, 2016).

⁵⁶ *See Id.*

⁵⁷ *See Id.*

⁵⁸ *See generally* U.S. EPA, *Nutrient Pollution Sources and Solutions*.

⁵⁹ *See* Anderson, *Estimated Annual Economic Impacts* at 4.

⁶⁰ *See* National Climate Assessment at 558-59.

⁶¹ Ove Hoegh-Guldberg et al., *The Impact of Climate Change on the World's Marine Ecosystems*, *Science* 328, 1523 (2010), DOI: 10.1126/science.1189930

other ecosystem services (*high confidence*). Spatial shifts of marine species due to projected warming will cause high-latitude invasions and high local-extinction rates in the tropics and semi-enclosed seas (*medium confidence*). Species richness and fisheries catch potential are projected to increase, on average, at mid and high latitudes (*high confidence*) and decrease at tropical latitudes (*medium confidence*). . . . The progressive expansion of oxygen minimum zones and anoxic “dead zones” is projected to further constrain fish habitat. Open-ocean net primary production is projected to redistribute and, by 2100, fall globally under all RCP scenarios. Climate change adds to the threats of over-fishing and other non-climatic stressors, thus complicating marine management regimes (*high confidence*).

For medium- to high-emission scenarios (RCP 4.5, 6.0, and 8.5), ocean acidification poses substantial risks to marine ecosystems, especially polar ecosystems and coral reefs, associated with impacts on the physiology, behavior, and population dynamics of individual species from phytoplankton to animals (*medium to high confidence*). Highly calcified mollusks, echinoderms, and reef-building corals are more sensitive than crustaceans (*high confidence*) and fishes (*low confidence*), with potentially detrimental consequences for fisheries and livelihoods. . . . Ocean acidification acts together with other global changes (e.g. warming, decreasing oxygen levels) and with local changes (e.g. pollution, eutrophication) (*high confidence*). Simultaneous drivers, such as warming and ocean acidification, can lead to interactive, complex, and amplified impacts for species and ecosystems.⁶²

The Third National Climate Assessment likewise has identified five significant ways in which climate change will adversely affect U.S. oceans and marine resources:

1. The rise in ocean temperature over the last century will persist into the future, with continued large impacts on climate, ocean circulation, chemistry, and ecosystems.
2. The ocean currently absorbs about a quarter of human-caused carbon dioxide emissions to the atmosphere, leading to ocean acidification that will alter marine ecosystems in dramatic yet uncertain ways.
3. Significant habitat loss will continue to occur due to climate change for

⁶² IPCC, 2014: Summary for Policymakers 17, in: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1-32.

many species and areas, including Arctic and coral reef ecosystems, while habitat in other areas and for other species will expand. These changes will consequently alter the distribution, abundance, and productivity of many marine species.

4. Rising sea surface temperatures have been linked with increasing levels and ranges of diseases in humans and marine life, including corals, abalones, oysters, fishes, and marine mammals.

5. Climate changes that result in conditions substantially different from recent history may significantly increase costs to businesses as well as disrupt public access and enjoyment of ocean areas.⁶³

Impacts from Ocean Acidification: The ocean's absorption of anthropogenic CO₂ has already resulted in more than a 30% increase in the acidity of ocean surface waters, at a rate likely faster than anything experienced in the past 300 million years, and ocean acidity could increase by 150% to 200% by the end of the century if CO₂ emissions continue unabated.⁶⁴ Ocean acidification negatively affects a wide range of marine species by hindering the ability of calcifying marine creatures to build protective shells and skeletons and by disrupting metabolism and critical biological function.⁶⁵ The adverse effects of ocean acidification are already being observed in wild populations, including reduced coral calcification rates,⁶⁶ reduced shell weights of foraminifera in the Southern Ocean,⁶⁷ and mass die-offs of larval Pacific oysters in the Pacific Northwest.⁶⁸

Coral reef ecosystems, which are estimated to harbor one-third of marine species and which support the livelihoods of a half billion people, are particularly threatened by ocean acidification. Some corals are already experiencing reduced calcification.⁶⁹ Due to the

⁶³ National Climate Assessment at 558.

⁶⁴ Orr, J. C., V. J. Fabry, O. Aumont, L. Bopp, S. C. Doney, R. a Feely, A. Gnanadesikan, N. Gruber, A. Ishida, F. Joos, R. M. Key, K. Lindsay, E. Maier-Reimer, R. Matear, P. Monfray, A. Mouchet, R. G. Najjar, G.-K. Plattner, K. B. Rodgers, C. L. Sabine, J. L. Sarmiento, R. Schlitzer, R. D. Slater, I. J. Totterdell, M.-F. Weirig, Y. Yamanaka, and A. Yool. 2005. Anthropogenic ocean acidification over the twenty-first century and its impact on calcifying organisms. *Nature* 437:681–6; . Feely, R., S. Doney, and S. Cooley. 2009. Ocean acidification: Present conditions and future changes in a high CO₂ world. *Oceanography* 22:36–47; Hönlisch, B., A. Ridgwell, D. N. Schmidt, E. Thomas, S. J. Gibbs, A. Sluijs, R. Zeebe, L. Kump, R. C. Martindale, S. E. Greene, W. Kiessling, J. Ries, J. C. Zachos, D. L. Royer, S. Barker, T. M. Marchitto, R. Moyer, C. Pelejero, P. Ziveri, G. L. Foster, and B. Williams. 2012. The geological record of ocean acidification. *Science* 335:1058–63.

⁶⁵ Fabry, V., B. Seibel, R. Feely, and J. Orr. 2008. Impacts of ocean acidification on marine fauna and ecosystem processes. *ICES Journal of Marine Science* 65:414–432; Feely et al 2009; Kroeker, K.J, R.L. Kordas, R. Crim, I.E. Hendriks, L. Ramajo, G.S. Singh, C.M. Duarte, and J-P Gattuso. 2013. Impacts of ocean acidification on marine organisms: quantifying sensitivities and interactions with warming. *Global Change Biology* 19: 1884-1896.

⁶⁶De'ath, G., J. M. Lough, and K. E. Fabricius. 2009. Declining coral calcification on the Great Barrier Reef. *Science* 323:116–119.

⁶⁷ Moy, A. D., W. R. Howard, S. G. Bray, and T. W. Trull. 2009. Reduced calcification in modern Southern Ocean planktonic foraminifera. *Nature Geoscience* 2: 276-280

⁶⁸ Barton, A., B. Hales, G. G. Waldbusser, C. Langdon, and R. A. Feely. 2012. The Pacific oyster, *Crassostrea gigas*, shows negative correlation to naturally elevated carbon dioxide levels: Implications for near-term ocean acidification effects. *Limnology and Oceanography* 57:698–710.

⁶⁹Cooper, T. F., G. De'Ath, K. E. Fabricius, and J. M. Lough. 2008. Declining coral calcification in massive Porites in two nearshore regions of the northern Great Barrier Reef. *Global Change Biology* 14:529–538; Gledhill, D. K., R.

synergistic impacts of ocean acidification, mass bleaching, and other stresses, reefs are projected to experience “rapid and terminal” declines worldwide at atmospheric CO₂ concentrations of 450 ppm.⁷⁰ Prominent coral scientists have called for reducing atmospheric CO₂ to less than 350 ppm to protect coral reefs from collapse.⁷¹

Numerous U.S. and international scientific and policy bodies have identified ocean acidification as an urgent threat to ocean ecosystems, food security, and society.⁷² The United Nations Environment Programme concluded that ocean acidification’s impact on marine organisms poses a threat to food security and the billions of people that rely on a marine-based diet.⁷³ Moreover, a recent study estimated that the damage our oceans will face from emissions-related problems will amount to \$428 billion a year by 2050 and nearly \$2 trillion per year by the century’s end.⁷⁴

In sum, climate change, driven primarily by the combustion of fossil fuels, poses a severe and immediate threat to the health, welfare, ecosystems and economy of the United States. These impacts are felt across the nation, including upon the public lands the Secretary of the Interior is charged with safeguarding. A rapid and deep reduction of emissions generated from fossil fuels, coal above all, is essential if such threats are to be minimized and their impacts mitigated.

a. Climate Policy

The United States has committed to the climate goal of holding the increase in the global average temperature to “well below 2°C above pre-industrial levels” and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels under the Paris Agreement.⁷⁵ Human-caused climate change is already causing widespread damage from intensifying global food and water insecurity, the increasing frequency of heat waves and other extreme weather

Wanninkhof, F. J. Millero, and M. Eakin. 2008. Ocean acidification of the greater Caribbean region 1996–2006. *Journal of Geophysical Research* 113:C10031; De’ath et al. 2009; Bates, N., A. Amat, and A. Andersson. 2010. Feedbacks and responses of coral calcification on the Bermuda reef system to seasonal changes in biological processes and ocean acidification. *Biogeosciences* 7:2509–2530.

⁷⁰ Veron, J. E. N., O. Hoegh-Guldberg, T. M. Lenton, J. M. Lough, D. O. Obura, P. Pearce-Kelly, C. R. C. Sheppard, M. Spalding, M. G. Stafford-Smith, and A. D. Rogers. 2009. The coral reef crisis: the critical importance of <350 ppm CO₂. *Marine Pollution Bulletin* 58:1428–36.

⁷¹ Veron et al. 2009; Frieler, K., M. Meinshausen, A. Golly, M. Mengel, K. Lebek, S.D. Donner, and O. Hoegh-Guldberg. Limiting global warming to 2°C is unlikely to save most coral reefs. *Nature Climate Change*. Published Online. doi: 10.1038/NCLIMATE1674.

⁷² NRC. 2010. *Ocean Acidification: A National Strategy to Meet the Challenges of a Changing Ocean*. National Academies Press; UNEP. 2010. *UNEP Emerging Issues: Environmental Consequences of Ocean Acidification: A Threat to Food Security*; Rogers, A. D., and D. d’A. Laffoley. 2011. *International Earth system expert workshop on ocean stresses and impacts Summary Report*. IPSO Oxford.

⁷³ UNEP 2010.

⁷⁴ Noone, K., R. Sumaila, and R. Diaz. 2012. *Valuing the Ocean : Executive Summary*, Stockholm Environment Institute. Stockholm Environment Initiative

⁷⁵ The Paris Agreement, which was adopted at the 2015 United Nations Framework Convention on Climate Change Conference of the Parties and signed by the United States in April 2016, commits all signatories to “[h]olding the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change.” See Paris Agreement at Article 2, Section 1(a),

<https://unfccc.int/resource/docs/2015/cop21/eng/109r01.pdf>

events, inundation of coastal regions by sea level rise and increasing storm surge, the rapid loss of Arctic sea ice, increasing species extinction risk, and the worldwide degradation of coral reefs. Limiting further temperature rise is needed to prevent increasingly dangerous and potentially irreversible impacts.⁷⁶ However, current climate policy and emissions reduction pledges in the United States and globally are not sufficient to achieve a 1.5°C or 2°C limit, and stronger action to reduce greenhouse gas emissions is urgently needed.⁷⁷

International consensus and commitments acknowledge the global climate emergency and demand decisive action to limit fossil fuel extraction. On December 12, 2015, 197 nation-state and supra-national organization parties meeting in Paris at the 2015 United Nations Framework Convention on Climate Change Conference of the Parties consented to an agreement (Paris Agreement) committing its parties to take action to avoid dangerous climate change.⁷⁸ As the Paris Agreement opens for signature in April 2016⁷⁹ and the United States is expected to sign the treaty as a legally binding instrument through executive agreement,⁸⁰ the Paris Agreement commits the United States to critical goals—both binding and aspirational—that mandate bold action on the United States’ domestic policy to rapidly reduce greenhouse gas emissions.

The United States and other parties to the Paris Agreement recognized “the need for an effective and progressive response to the urgent threat of climate change on the basis of the best available scientific knowledge.”⁸¹ The Paris Agreement articulates the practical steps necessary to obtain its goals: parties including the United States have to “reach global peaking of greenhouse gas emissions *as soon as possible* . . . and to *undertake rapid reductions* thereafter in

⁷⁶ IPCC. 2014. Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, at 65, Box 2.4, Figure 2.5, https://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_FINAL_full.pdf; U.N. Framework Convention on Climate Change. 2015. Subsidiary Body for Scientific and Technical Advice. Report on the Structured Expert Dialogue on the 2013-15 Review, No. FCCC/SB/2015/INF.1, at 15-16, 30-32, <http://unfccc.int/resource/docs/2015/sb/eng/inf01.pdf>; Schleussner, C-F. et al. 2016. Differential climate impacts for policy-relevant limits to global warming: the case of 1.5°C and 2°C. *Earth System Dynamics* 7: 327-351.

⁷⁷ Climate Action Tracker ranks the United States INDC (intended nationally determined contribution) submitted to the UNFCCC as “not yet consistent with limiting warming to below 2°C unless other countries make much deeper reductions and comparably greater effort than the USA.” Climate Action Tracker finds that current US climate policy is insufficient to meet the US INDC. See <http://climateactiontracker.org/countries/usa.html> Analyses of the aggregate effect of national climate pledges (INDCs or intended nationally determined contributions) submitted to the UNFCCC under the Paris Agreement estimate a 2.7 to 3.7°C temperature rise above pre-industrial levels. See Rogelj, J. et al. 2016. Paris Agreement climate proposals need a boost to keep warming well below 2°C. *Nature* 534: 631-639; UNEP. 2015. The Emissions Gap Report 2015. United Nations Environment Programme (UNEP), Nairobi, http://uneplive.unep.org/media/docs/theme/13/EGR_2015_301115_lores.pdf; Climate Action Tracker. 2015. 2.7°C is not enough – we can get lower, <http://climateactiontracker.org/news/253/Climate-pledges-will-bring-2.7C-of-warming-potential-for-more-action.html>; Climate Interactive. 2015. Climate Scoreboard: UN Climate Pledge Analysis, <https://www.climateinteractive.org/programs/scoreboard/>.

⁷⁸ Paris Agreement, Art. 2.

⁷⁹ Paris Agreement, Art. 20(1).

⁸⁰ See U.S. Department of State, Background Briefing on the Paris Climate Agreement, (Dec. 12, 2015), <http://www.state.gov/r/pa/prs/ps/2015/12/250592.htm>.

⁸¹ *Id.*, Recitals.

accordance with best available science,”⁸² imperatively commanding that developed countries specifically “should continue taking the lead by undertaking economy-wide absolute emission reduction targets”⁸³ and that such actions reflect the “highest possible ambition.”⁸⁴

The Paris Agreement codifies the international consensus that climate change is an “urgent threat” of global concern,⁸⁵ and commits all signatories to achieving a set of global goals. Importantly, the Paris Agreement commits all signatories to an articulated target to hold the long-term global average temperature “to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels”⁸⁶ (emphasis added).

In light of the severe threats posed by even limited global warming, the Paris Agreement established the international goal of limiting global warming to 1.5°C above pre-industrial levels in order to “prevent dangerous anthropogenic interference with the climate system,” as set forth in the UNFCCC, a treaty which the United States has ratified and to which it is bound.⁸⁷ The Paris consensus on a 1.5°C warming goal reflects the findings of the IPCC and numerous scientific studies that indicate that 2°C warming would exceed thresholds for severe, extremely dangerous, and potentially irreversible impacts.⁸⁸ Those impacts include increased global food and water insecurity, the inundation of coastal regions and small island nations by sea level rise and increasing storm surge, complete loss of Arctic summer sea ice, irreversible melting of the Greenland ice sheet, increased extinction risk for at least 20-30% of species on Earth, dieback of the Amazon rainforest, and “rapid and terminal” declines of coral reefs worldwide.⁸⁹ As scientists noted, the impacts associated with 2°C temperature rise have been “revised upwards, sufficiently so that 2°C now more appropriately represents the threshold between ‘dangerous’

⁸² *Id.*, Art. 4(1).

⁸³ *Id.*, Art. 4(4).

⁸⁴ *Id.*, Art. 4(3).

⁸⁵ *Id.*, Recitals.

⁸⁶ *Id.*, Art. 2.

⁸⁷ See U.N. Framework Convention on Climate Change, Cancun Agreement. Available at <http://cancun.unfccc.int/> (last visited Jan 7, 2015); United Nations Framework Convention on Climate Change, Copenhagen Accord. Available at http://unfccc.int/meetings/copenhagen_dec_2009/items/5262.php (last accessed Jan 7, 2015). The United States Senate ratified the UNFCCC on October 7, 1992. See <https://www.congress.gov/treaty-document/102nd-congress/38>.

⁸⁸ See Paris Agreement, Art. 2(1)(a); U; U.N. Framework Convention on Climate Change, Subsidiary Body for Scientific and Technical Advice, Report on the structured expert dialogue on the 2013-15 review, No. FCCC/SB/2015/INF.1 at 15-16 (June 2015); IPCC AR5 Synthesis Report at 65 & Box 2.4.

⁸⁹ See Jones, C. et al, Committed Terrestrial Ecosystem Changes due to Climate Change, 2 *Nature Geoscience* 484, 484-487 (2009); Smith, J. B. et al., Assessing Dangerous Climate Change Through an Update of the Intergovernmental Panel on Climate Change (IPCC) ‘Reasons for Concern’, 106 *Proceedings of the National Academy of Sciences of the United States of America* 4133, 4133-37 (2009); ; Veron, J. E. N. et al., The Coral Reef Crisis: The Critical Importance of <350 ppm CO₂, 58 *Marine Pollution Bulletin* 1428, 1428-36, (2009); ; Warren, R. J. et al., Increasing Impacts of Climate Change Upon Ecosystems with Increasing Global Mean Temperature Rise, 106 *Climatic Change* 141-77 (2011); Hare, W. W. et al., Climate Hotspots: Key Vulnerable Regions, *Climate Change and Limits to Warming*, 11 *Regional Environmental Change* 1, 1-13 (2011); ; Frieler, K. M. et al., Limiting Global Warming to 2°C is Unlikely to Save Most Coral Reefs, *Nature Climate Change*, Published Online (2013) doi: 10.1038/NCLIMATE1674; ; M. Schaeffer et al., Adequacy and Feasibility of the 1.5°C Long-Term Global Limit, *Climate Analytics* (2013).

and ‘extremely dangerous’ climate change.”⁹⁰ Consequently, a target of 1.5°C or less temperature rise is now seen as essential to avoid dangerous climate change and has largely supplanted the 2°C target that had been the focus of most climate literature until recently. As demonstrated below, under *any* formulation, the majority of United States fossil fuels, particularly federal coal, must stay in the ground.

b. Carbon Budgets Preclude New Coal Leasing

Immediate and aggressive greenhouse gas emissions reductions are necessary to keep warming below a 1.5° or 2°C rise above pre-industrial levels. Put simply, there is only a finite amount of CO₂ that can be released into the atmosphere without rendering the goal of meeting the 1.5°C target virtually impossible. A slightly larger amount could be burned before meeting a 2°C limit became an impossibility. Globally, fossil fuel reserves, if all were extracted and burned, would release enough CO₂ to exceed this limit several times over.⁹¹

The question of what amount of fossil fuels can be extracted and burned without negating a realistic chance of meeting a 1.5 or 2°C target is relatively easy to answer, even if the answer is framed in probabilities and ranges. The IPCC Fifth Assessment Report and other expert assessments have established global carbon budgets, or the total amount of remaining carbon that can be burned while maintain some probability of staying below a given temperature target. According to the IPCC, total cumulative anthropogenic emissions of CO₂ must remain below about 1,000 gigatonnes (GtCO₂) from 2011 onward for a 66% probability of limiting warming to 2°C above pre-industrial levels.⁹² Given more than 100 GtCO₂ have been emitted since 2011,⁹³ the remaining portion of the budget under this scenario is well below 900 GtCO₂. To have an 80% probability of staying below the 2°C target, the budget from 2000 is 890 GtCO₂, with less than 430 GtCO₂ remaining.⁹⁴

To have even a 50% probability of achieving the Paris Agreement goal of limiting warming to 1.5°C above pre-industrial levels equates to a carbon budget of 550-600 GtCO₂ from 2011 onward,⁹⁵ of which more than 100 GtCO₂ has already been emitted. To achieve a 66% probability of limiting warming to 1.5°C requires adherence to a more stringent carbon budget of only 400 GtCO₂ from 2011 onward,⁹⁶ of which less than 300 GtCO₂ remained at the start of 2015. An 80% probability budget for 1.5°C would have far less than 300 GtCO₂ remaining. Given that global CO₂ emissions in 2014 alone totaled 36 GtCO₂,⁹⁷ humanity is rapidly

⁹⁰ Anderson, K. and A. Bows, Beyond ‘Dangerous’ Climate Change: Emission Scenarios for a New World, 369 *Philosophical Transactions, Series A, Mathematical, Physical, and Engineering Sciences* 20, 20–44 (2011).

⁹¹ Cmons at 6, 33 n.2.

⁹² IPCC AR5 Physical Science Basis at 27; IPCC AR5 Synthesis Report at 63-64 & Table 2.2.

⁹³ From 2012-2014, 107 GtCO₂ was emitted (*see* Annual Global Carbon Emissions at <http://co2now.org/Current-CO2/CO2-Now/global-carbon-emissions.html>).

⁹⁴ Carbon Tracker Initiative at 6; Meinshausen *et al.* 2009 at 1159

⁹⁵ IPCC AR5 Synthesis Report at 64 & Table 2.2.

⁹⁶ *Id.*

⁹⁷ *See* Global Carbon Emissions, <http://co2now.org/Current-CO2/CO2-Now/global-carbon-emissions.html>

consuming the remaining burnable carbon budget needed to have even a 50/50 chance of meeting the 1.5°C temperature goal.⁹⁸

The science is clear that the vast majority of the world’s fossil fuels must remain in the ground in order to maintain any reasonable hope of limiting global warming to 1.5° or even 2°C above pre-industrial levels. Global fossil fuel reserves and resources far exceed the carbon budgets needed to stay below a 1.5° or 2°C temperature target.⁹⁹

Two recent studies estimated that global oil, gas, and coal resources considered currently economically recoverable contain potential greenhouse gas emissions estimated at 2,900 GtCO₂¹⁰⁰ and 4196 GtCO₂¹⁰¹ respectively. Other sources estimate even greater global fossil fuel reserves at 3,677 to 7,120 GtCO₂.¹⁰² When considering all fossil fuel resources (defined as those recoverable over all time with both current and future technology irrespective of current economic conditions), potential combustion emissions have been estimated at nearly 11,000 GtCO₂¹⁰³ upwards to 31,353 and 50,092 GtCO₂.¹⁰⁴

Even the lowest of these estimates (2,900 GtCO₂) is more than three times greater than the most generous carbon budget nominally consistent with a 2°C temperature limit (~900 GtCO₂), while the largest (50,092 GtCO₂) is over 160 times greater than the remaining budget for a 66% probability of not exceeding a 1.5°C limit (<300 GtCO₂).

As stated by one study, “the disparity between what resources and reserves exist and what can be emitted while avoiding a temperature rise greater than the agreed 2C limit is

⁹⁸ In addition to limits on the *amount* of fossil fuels that can be utilized, emissions pathways compatible with a 1.5 or 2°C target also have a significant temporal element. Leading studies make clear that to reach a reasonable likelihood of stopping warming at 1.5° or even 2°C, global CO₂ emissions must be phased out by mid-century and likely as early as 2040-2045. *See, e.g.* Joeri Rogelj *et al.*, Energy system transformations for limiting end-of-century warming to below 1.5°C, 5 Nature Climate Change 519, 522 (2015). United States focused studies indicate that we must phase out fossil fuel CO₂ emissions even earlier—between 2025 and 2040—for a reasonable chance of staying below 2°C. *See, e.g.* Climate Action Tracker, <http://climateactiontracker.org/countries/usa>. Issuing new legal entitlements to explore for and extract federal fossil fuels for decades to come is wholly incompatible with such a transition.

⁹⁹ Analyses by the Carbon Tracker Initiative estimated that 80% of proven fossil fuel reserves must be kept in the ground to have a reasonable probability (75-80%) of staying below even 2°C. This estimate includes only the fossil fuel reserves that are considered currently economically recoverable with a high probability of being extracted. *See* Carbon Tracker Initiative at 2, 6.

¹⁰⁰ McGlade and Ekins at 187-192.

¹⁰¹ Raupach, M. *et al.*, Sharing a quota on cumulative carbon emissions. 4 Nature Climate Change 873-879 (2014) at Figure 2.

¹⁰² IPCC, 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change at Table 7.2 [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. (“IPCC AR5 Mitigation of Climate Change”)

¹⁰³ McGlade and Ekins at 188.

¹⁰⁴ IPCC AR5 Mitigation of Climate Change at Table 7.2.

therefore stark.”¹⁰⁵ Another recent report on global carbon reserves found that:

The reserves of coal, oil and natural gas outlined in this report contain enough carbon to rocket the planet far beyond the 2°C limit. Warming from fossil fuels puts other carbon sinks at risk. As permafrost melts and peat bogs dry, they emit enormous quantities of carbon dioxide, furthering a chain reaction where the release of carbon results in a warmer world, which in turn releases more carbon.¹⁰⁶

The unleased federal coal resource alone is estimated at 212 GtCO₂e, or almost two-thirds of the remaining global carbon budget for a reasonable probability of limiting warming to 1.5°C.¹⁰⁷

In the United States, coal is the largest and most carbon dioxide-intensive conventional fossil fuel resource.¹⁰⁸ The Department of Interior’s fossil fuel leasing program contributes about one-quarter of all US fossil fuel emissions, with 14% of US emissions coming from the federal coal program,¹⁰⁹ which comprises approximately 41% of total US coal production.¹¹⁰ Coal mining, particularly underground mining, also contributes substantial additional methane emissions, with vastly higher radiative forcing potential than carbon dioxide.¹¹¹

Mitigation pathways for holding temperature rise well below 2°C mandate a rapid phase-out of coal emissions.¹¹² For example, a recent study estimates that 95% of US coal reserves,

¹⁰⁵ McGlade and Ekins at 188.

¹⁰⁶ Cimons at 6.

¹⁰⁷ Mulvaney et al. at 5. The remaining carbon budget for a 66% probability of limiting warming to 1.5°C and 2°C above pre-industrial is 240 GtCO₂ and 850 GtCO₂, respectively, from 2015 onward, equivalent to ~334 GtCO₂e and ~1180 GtCO₂e (gigatonnes CO₂ equivalent) based on the ratio of 1.39 CO₂e/CO₂ from Meinshausen et al. (2009). [See Meinshausen, M. et al. 2009. Greenhouse gas emission targets for limiting global warming to 2 degrees Celsius. *Nature* 458: 1158–1162.] 212 GtCO₂e comprises 63% of a 334 GtCO₂e budget and 18% of an 1180 GtCO₂e budget.

¹⁰⁸ See Environmental Protection Agency, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2014 (April 2016) at 3-5.

¹⁰⁹ See Climate Accountability Institute. 2015. Memorandum from Richard Heede to Friends of The Earth and Center for Biological Diversity, at http://webiva-downton.s3.amazonaws.com/877/3a/7/5721/Exhibit_1-1_ONRR_ProdEmissions_Heede_7May15.pdf; Stratus Consulting. 2014. Greenhouse Gas Emissions from Fossil Energy Extracted from Federal Lands and Waters: An Update, at 13, <http://wilderness.org/sites/default/files/Stratus-Report.pdf>

¹¹⁰ U.S. Energy Information Administration. 2014. Sales of Fossil Fuels Produced from Federal and Indian Lands, FY 2003 through FY 2013, at Table 1, <http://www.eia.gov/analysis/requests/federallands/pdf/eia-federallandsales.pdf>.

¹¹¹ EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks at ES-6; IPCC AR5 Physical Science Basis Chapter 8 at 714, Table 8.7 & note b (20-year radiative forcing potential of fossil fuel methane is 87 times that of carbon dioxide).

¹¹² McGlade, C. and P. Ekins. 2015. The geographic distribution of fossil fuels unused when limiting global warming to 2°C. *Nature* 517: 187-192; Rogelj, J. et al. 2015. Energy system transformations for limiting end-of-century warming to below 1.5°C. *Nature Climate Change* 5: 519-528; Raupach, M. et al. 2014. Sharing a quota on cumulative carbon emissions. *Nature Climate Change* 4: 873-879; Stockholm Environment Institute. 2016. How would phasing out U.S. federal leases for fossil fuel extraction affect CO₂ emissions and 2°C goals? Peter Erickson and Michael Lazarus, Working Paper No. 2016-02, <https://www.sei-international.org/mediamanager/documents/Publications/Climate/SEI-WP-2016-02-US-fossilfuel-leases.pdf>

including both federal and non-federal coal, must remain unburned to preserve a reasonable probability of remaining below 2°C.¹¹³ Coal mining, transport, combustion, disposal, and cleanup also have significant external costs on public health and the environment that must be taken into consideration in the PEIS.¹¹⁴

A near-term phase-out of federal coal is also critical because new leasing locks in investment and high-carbon infrastructure for mining, transport, and coal combustion, all of which is inconsistent with the pressing need to end fossil fuel emissions.¹¹⁵ A rapid end to federal coal extraction would send an important signal internationally and domestically to markets, utilities, investors and other nations that the United States is committed to upholding its climate obligation to limit temperature rise to well below 2°C.

c. Role of Federal Coal

The Department of Interior's fossil fuel leasing program contributes about one-quarter of all US fossil fuel emissions, with approximately 14% of US emissions coming from the federal coal program. See Climate Accountability Institute. 2015.¹¹⁶ Based on EIA, USGS, and BLM data, the best available estimate of the entire unleased federal coal resource is 212 GtCO_{2e}, or almost two-thirds of the entire remaining global carbon budget for maintaining a reasonable probability of limiting warming to 1.5°C.¹¹⁷ The PEIS must not only quantify the contribution of the federal coal leasing program to greenhouse gas emissions and global carbon budgets, but also the foreseeable results of the various alternatives on near- and medium-term national and global emissions. The fact that emissions rates are influenced by multiple factors (including market, policy, and regulatory factors) does not obscure the fact that a variety of models exist and can be used to evaluate the emissions consequences of leasing policy under a variety of scenarios (including business as usual, implementation of the Clean Power Plan, and predicted coal demand in a scenario that achieves 450 ppm CO₂ climate targets).

As an initial matter, it is important to note that the role of the federal coal program in coal supply, infrastructure, consumption, is larger than its (considerable) share of U.S. coal production. As the Institute for Energy Economics and Financial Analysis has noted,

¹¹³ McGlade and Elkins (2015) use a global least-cost model for allocating unburnable fossil fuel reserves that does not incorporate global equity considerations; including equity considerations suggests that more US fossil fuel reserves should remain unburned.

¹¹⁴ See Epstein, P.R. et al. 2011. Full cost accounting for the life cycle of coal. *Annals of the New York Academy of Sciences* 1219: 73-98.

¹¹⁵ Climate Action Tracker. 2015. The Coal Gap: planned coal-fired power plants inconsistent with 2C and threaten achievement of INDCs, http://climateactiontracker.org/assets/publications/briefing_papers/CAT_Coal_Gap_Briefing_COP21.pdf

¹¹⁶ Memorandum from Richard Heede to Friends of The Earth and Center for Biological Diversity, at http://webiva-downton.s3.amazonaws.com/877/3a/7/5721/Exhibit_1-1_ONRR_ProdEmissions_Heede_7May15.pdf; Stratus Consulting. 2014. Greenhouse Gas Emissions from Fossil Energy Extracted from Federal Lands and Waters: An Update, at 13, <http://wilderness.org/sites/default/files/Stratus-Report.pdf>

¹¹⁷ Mulvaney et al. 2015 at 4; see IPCC AR5 Synthesis Report at 63-64 & Table 2.2; Rogelj 2016 at Table 2.

The availability of cheap coal from the PRB has not only provided the industry with a price advantage that has allowed much deeper market penetration throughout the years—from 5 percent in 1982 to nearly 48 percent today—but it has also had significant implications for the nation’s energy policy. For the past 30 years, the U.S. government has effectively selected coal as its primary energy source to power the nation’s electric grid. In addition to its market penetration, analysts have concluded that coal’s dominance has effectively prevented the development of public-private partnership policies and programs to improve energy diversity in the United States.¹¹⁸

In other words, the expectation of a continued policy below-market federal coal leasing, particularly from the Powder River Basin, encourages investment in coal mining, coal export schemes, and, in particular, continued infrastructure investment and lock-in coal transportation, export, and electricity generation, based on the assumption that the BLM’s leasing policies will continue to provide a plentiful supply of cheap, reliable, relatively low-sulfur sub-bituminous coal from the Powder River Basin. As the IEEFA noted, “Given that the United States owns almost all the coal in the [Powder River Basin] region, the U.S. government holds an effective monopoly of western coal. As a result, government policies—or more precisely those of the DOI—are extremely influential and shape annual coal production levels and the market price of coal.”

Evaluating the market and resulting emissions consequences of the coal leasing programs is both required by NEPA and well within BLM’s capabilities.¹¹⁹ In recent months, at least four sophisticated efforts have been made to evaluate the market and emissions consequences of alternative federal coal leasing policies, and concluded that a policy of ending new federal coal lease issuance or modification would have significant effects on mitigating greenhouse gas emissions, while still exceeding both anticipated coal demand for the coming decades, and the time horizon for exceeding 1.5° and 2°C carbon budgets. BLM can and should acknowledge and make use of the sources and methods in these studies to formulate quantitative assessments of the emissions and carbon budget consequences of leasing alternatives (including cessation of leasing, a declining production schedule based on meeting climate targets, and incorporation of a meaningful carbon charge on leased coal production into new or modified lease terms).

In January 2016, Vulcan Philanthropy., employing analytic models supplied by ICF International, “commissioned a forward-looking analysis using ICF International’s

¹¹⁸ Institute for Energy Economics and Financial Analysis, “The Great Giveaway: An analysis of the costly failures of federal coal leasing in the Powder River Basin” (June 2012).

¹¹⁹ See *Ctr. for Biological Diversity v. National Highway Traffic Safety Admin.*, 538 F.3d 1172 (9th Cir. 2008); *Mid States Coalition for Progress v. STB*, 345 F.3d 520 (8th Cir. 2003); *High Country Conservation Advocates v. United States Forest Serv.*, 52 F. Supp. 3d 1174, 1196 (D. Colo. 2014); for examples of quantifying end-use emissions of coal leasing, see U.S. FOREST SERV., RULEMAKING FOR COLORADO ROADLESS AREAS, SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT (Nov. 2015) .

(ICF) Integrated Planning Model (IPM®), relying on assumptions and scenarios as specified by Vulcan.”¹²⁰ The Vulcan study applied the ICF model of coal prices and consumption to various scenarios including no Clean Power Plan, a Clean Power Plan with mass-based caps on emissions, and a Clean Power Plan with emissions trading under a rate-based rule. The study then assessed the affects of various policy choices, including royalty increases based on the Social Cost of Carbon and (in their policy case 6), a 100% ramp-down of federal coal leasing. The Vulcan application of the ICF model found that a “production limit policy case,” i.e. a cessation of new federal leasing, would have significant impacts on coal production, coal markets and exports, generation capacity and mix, and ultimately CO₂ emissions.¹²¹ Ultimately, Vulcan found that ending new leasing would sharply reduce PRB coal production from 2037 on, with only a partial shift to production in other regions.¹²² This would also end Montana coal exports starting in 2040.¹²³ The net result of Vulcan’s finding is that, for a no new leasing policy, U.S. coal production would decline 348 Mt through 2040 without the Clean Power Plan, and 85 Mt under a mass-based Clean Power Plan.¹²⁴ This in turn would result in a shift to more efficient gas-fired generation and, to a lesser extent, renewable energy deployment and efficiency improvement.¹²⁵ Vulcan concludes the net effect on CO₂ emissions in 2040 would be nearly 500 Mt/year without the CPP, and a lesser reduction under the CPP.¹²⁶

In May 2016, the Stockholm Environment Institute, building on the Vulcan/ICF modeling, undertook a more nuanced analysis of the emissions consequences of federal leasing cessation, taking into account additional factors including (a) a supply and demand model for coal exports; (b) exclusion of metallurgical coal; (c) accounting for non-federal coal that may be constrained due to the highly-intermingled ownership of federal and nonfederal coal in the PRB.¹²⁷ Applying this more nuanced model to Vulcan’s ICF results, SEI ultimately found:

In our reference case, assuming Clean Power Plan implementation, we find that leasing restrictions would reduce CO₂ emissions in 2030 from coal by about 107 Mt CO₂, but increased use of gas would increase emissions by about 36 Mt CO₂, resulting in a net reduction of 71 Mt CO₂.¹²⁸

SEI notes that this 2030 reduction of 2030 million tons CO₂ would be rivaled, as an emissions reduction policy, only by the EPA CAFÉ standards for light-duty vehicles

¹²⁰ Vulcan Philanthropy, *Federal Coal Leasing Reform Options: Effects on CO₂ Emissions and Energy Markets* (Jan. 2016).

¹²¹ *See id.* at 49-57.

¹²² *Id.* at 46-47.

¹²³ *Id.* at 50.

¹²⁴ *Id.* at 47.

¹²⁵ *Id.* at 51-52.

¹²⁶ *Id.* at 56-57, Exhibits 89-90.

¹²⁷ Peter Erickson and Michael Lazarus, *How would phasing out U.S. federal leases for fossil fuel extraction affect CO₂ emissions and 2°C goals?* at 18-22 (May 2016), SEI Working Paper 2016-02.

¹²⁸ *Id.* at 22.

(approximately 200 Mt) and the Clean Power Plan (up to 610 Mt).¹²⁹ Should the Clean Power Plan not be implemented, a coal leasing cessation would reduce emissions by 270 Mt in 2030 – nearly half the savings of the CPP.¹³⁰ Ultimately, SEI concludes that ending new leasing (and lease modifications expanding reserves), would

Send national coal production on a declining pathway, potentially to levels more consistent with a 2°C pathway for U.S. coal extraction. Such an action could leave 4 billion short tons of federal coal in the ground that otherwise would be combusted between now and 2040, equivalent to about 7 Gt of CO₂ emissions.¹³¹

In July 2016, Eco-Shift consulting projected the “production horizons”- the number of years’ worth of remaining production - from currently leased federal fossil fuels using the U.S. Energy Information Administration’s (EIA) 2016 “reference case” for fossil fuel production.¹³² EcoShift found that, under the EIA reference case (including Clean Power Plan implementation), “Coal under federal lease would last 25 years, through 2041.”¹³³ This production horizon greatly exceeds the dates at which carbon budgets for 1.5°C and 2°C would be exceeded by continued emissions at 2014 rates – 2021 and 2036 respectively.¹³⁴ The discrepancy between the production horizon for already-leased coal and carbon budget exceedance dates makes clear that, barring either extraordinarily rapid global emissions declines or rapid, widespread and successful deployment of carbon capture and sequestration technology, there is no scenario where new federal coal leasing at any significant level is consistent with the nation’s stated climate aims.

Significantly, both Vulcan and SEI examined the effect of leasing policies in a context where the Clean Power Plan was the only meaningful downstream constraint on U.S. coal consumption. More recently, Energy Transition Advisors, Earth Track, and Carbon Tracker Initiative undertook to examine the role of federal Powder River Basin coal in a (modestly ambitious) climate scenario – the International Energy Agency’s “450 scenario” aimed at modeling the energy demands consistent with an atmospheric CO₂ concentration of 450 ppm, and an ensuing 50% probability of keeping warming within 2°C of preindustrial levels.¹³⁵ Although the IEA “450 scenario” is less ambitious than Paris goals or the demands of protecting health and biodiversity, it provides an existing model for assessing the role of federal leasing, PRB production, and coal markets in a modestly climate-constrained scenario.¹³⁶ The ETA first examined U.S. EIA “reference case” coal production projections under the CPP to conclude that demand for PRB coal tracks reasonably well with US-wide demand for power-sector control under a modestly CO₂-constrained scenario.¹³⁷ It then applies coal trajectories under the IEA

¹²⁹ *Id.* at 28 & Figure 7.

¹³⁰ *Id.*

¹³¹ *Id.* at 31.

¹³² Dustin Mulvaney et al., *Over-Leased: How Production Horizons of Already Leased Federal Fossil Fuels Outlast Global Carbon Budgets 1* (July 2016).

¹³³ *Id.*

¹³⁴ *Id.* at Figure 1.

¹³⁵ Mark Fulton et al., *Enough Already: Meeting 2°C PRB Coal Demand Without Lifting the Federal Moratorium* (July 2016).

¹³⁶ The IEA 450 Scenario also makes aggressive assumptions regarding the deployment of CCS technology; Fulton et al. provides alternative scenarios involving later CCS development. *See id.* at 6 n.10.

¹³⁷ *Id.* at 7.

“450 Scenario” to the Powder River Basin, to find, under various CCS scenarios, a rapid decline in demand for PRB coal from 2016 through 2030, leveling off somewhat around 2030.¹³⁸ Fulton et al. then compared these anticipated demand scenarios with the best available information regarding coal deposits already under lease in the PRB.¹³⁹ Their conclusion was that, “[u]nder the 450 Scenario with no CCS, potential production from existing leases is sufficient to meet projected demand in every year through 2040.”¹⁴⁰ Moreover, they found that “even without additional efforts to pursue a 2°C scenario beyond those already announced, significant production from new leases is not expected to be needed until 2031.”¹⁴¹

The implications of the ETA study are worth noting at length, because they cut to the core of the inquiry presently before BLM as to how to align the federal coal program with climate goals:

Our analysis suggests that pursuit of a 2°C or less climate commitment obviates the need to award new leases for PRB coal mining through at least 2040. Under the power system that the US must transition to if it is to fulfill its Paris Agreement commitments, the 745 Mt of potential production from new PRB mines is unneeded to meet projected demand through 2040.

In contrast, awarding leases for such mines invites up to \$2.9 billion of investment that is at odds with America’s stated climate ambitions and should prove unnecessary as the world moves towards a 2°C outcome. As PRB mines account for the majority of coal produced on federal lands, this suggests that a continued moratorium on all new leases is warranted under a 2°C scenario. Indeed, taking steps to slow production from the PRB would send a strong signal to other parties to the Paris Agreement that the United States is beginning to put its own house in order.

Note that because the US’s current energy trajectory (as exemplified by the AEO Reference Case) does not fully align with a 2°C trajectory, a federal coal moratorium has the potential to yield incremental climate benefits even if current federal policies such as the Clean Power Plan are fully implemented. Inasmuch as implementation of such demand--side policies is delayed or weakened due to political opposition, then the role for supply--side restrictions such as a federal coal moratorium become all the more salient as drivers of US alignment with a 2°C scenario.¹⁴²

The Vulcan, Ecoshift, SEI, and ETA studies make use of well-established government and industry data sources and models to provide reasonable forecasts of the consequences of alternative coal leasing policies on coal production, prices, and resulting consumption and emissions. BLM clearly has the tools available to create detailed

¹³⁸ *Id.* at 9 & Figure 1.

¹³⁹ *Id.* at 11 & Figure 3.

¹⁴⁰ *Id.* at 12.

¹⁴¹ *Id.*

¹⁴² *Id.* at 17.

quantitative models of the coal program’s consequences, and must do so in order to meet both its NEPA obligations and stated goals for this process. In particular, the ETA study provides a clear path for methods to analyze the role of federal coal leasing in under a scenario which at least begins to approach meeting U.S. climate targets. In order to truly assess the consistency of the coal program with COP21 commitments, BLM should also develop and analyze models for coal demand under GHG concentration scenarios that achieve a higher likelihood of remaining under 2°C and “substantially below,” or 1.5°C.

d. BLM Must Consider the Climate, Environmental, and Economic Consequences of Its Policies on Coal Export

As coal consumption for power generation declines domestically, facilitating schemes for coal export threatens to undermine climate policy by discouraging efficiency and renewable energy development abroad. As domestic coal consumption has declined, exports of Montana federal coal have increased greatly in 2013 and 2014.¹⁴³ One study found that “[p]roposed coal export facilities in the Northwest will result in more coal consumption in Asia and undermine China’s progress towards more efficient power generation and usage. Decisions the Northwest makes now will impact Chinese energy habits for the next half-century; the lower coal prices afforded by Northwest coal exports encourage burning coal and discourage the investments in energy efficiency that China has already undertaken.”¹⁴⁴

The Government Accountability Office has faulted BLM for its persistent turning a blind eye to the export schemes of Powder River Basin coal producers. In December, the GAO found that, despite the industry’s public claims of hopes for coal export:

BLM considers coal exports to a limited extent when developing an estimate of fair market value and generally does not explicitly consider estimates of the total amount of coal in the United States that can be mined economically, known as domestic reserve estimates. In the few state offices that did consider exports, we generally found the same generic statements in appraisal and economic reports that stated in general terms the possibility of future growth in coal exports, and there was limited tracking of exports from specific mines. As a result, BLM may not be factoring specific export information into appraisals or keeping up-to-date with emerging trends.¹⁴⁵

The PEIS process provides BLM both an obligation and an opportunity to make an informed and conscious decision as to whether it is consistent with its statutory obligations to subsidize increased coal consumption in China by committing to the long-

¹⁴³ Williams-Derry, Clark, Unfair Market Value II: Coal Exports and the Value of Federal Coal, Sightline Institute (2016).

¹⁴⁴ Thomas M. Power, “The Greenhouse Gas Impact of Exporting Coal from the West Coast: An Economic Analysis” (July 2011).

¹⁴⁵ Government Accountability Office, Coal Leasing: BLM Could Enhance Appraisal Process, More Explicitly Consider Coal Exports, and Provide More Public Information 36 (Dec. 2013), GAO-14-140.

term availability of relatively inexpensive Powder River Basin coal for export purposes. The most detailed study to date of the market, consumption, and resulting greenhouse gas consequences of Powder River Basin coal export to China assessed the interaction of coal prices, Chinese demand and capacity, combustion and transportation impacts, and concluded that PRB coal exports to China would (a) lower coal costs for southeastern China coastal markets, increasing the incentive for long-term investment in coal-fired generation, and (b) discourage Chinese investment in efficiency and low-carbon energy sources.¹⁴⁶ The Power export study also noted that, because clean energy technologies are a growing market, and coal mining and shipping mature industries with relatively low employment potential, a policy of subsidizing raw coal export undermines U.S. investment and economic advantage in less carbon-intensive and more employment-intensive clean energy technologies.¹⁴⁷

IV. Public Health Impacts of the Federal Coal Leasing Program

From cradle to grave, coal's impact on human health is undeniable. At every stage of coal's life-cycle, health impacts are clearly documented including during mining, transport, preparation at the power plant, combustion, disposal of post-combustion wastes, and export abroad. Coal combustion in particular has been well-studied, with compelling evidence of widespread health effects on neighboring communities. Burning coal to generate electricity harms human health and compounds many of the major public health problems facing the world today. The pollution from coal affects all major organ systems in the human body, and contributes to diseases affecting large portions of the U.S. population, including asthma, lung cancer, heart disease and stroke.¹⁴⁸ It interferes with lung development, increases the risk of heart attacks, and compromises brain capacity and mental health. In addition, the discharge of carbon dioxide into the atmosphere associated with burning coal is responsible for more than 30% of total U.S. carbon dioxide pollution, contributing significantly to global warming and its associated health impacts.¹⁴⁹

However, each of these steps in the coal life-cycle, in addition to coal combustion, generates pollution. Before coal can be used in power plants, it first must be mined, washed, and transported. After being burned in power plants, the remaining ash must be stored or disposed of. Because demand for coal-fired power has declined in recent years domestically, coal exports are on the rise in the United States. Coal export facilities are notorious for impacts on neighboring communities, including health impacts associated with coal dust and shipping pollution. This section will provide an overview of the public health impacts derived from each of the four

¹⁴⁶ Thomas M. Power & Donovan S. Power, "The Impact of Powder River Basin Coal Exports on Global Greenhouse Gas Emissions" 60 (May 2013).

¹⁴⁷ *Id.* at 64-70.

¹⁴⁸ See generally E. Burt, et al., *Scientific Evidence of Health Effects from Coal Use in Energy Generation*, Healthcare Research Collaborative, University of Illinois at Chicago School of Public Health (April 2013); A. Lockwood, et al., *Coal's Assault on Human Health*, Physicians for Social Responsibility (Nov. 2009).

¹⁴⁹ See *Id.*

major stages of the coal life-cycle: mining and transport, combustion, disposal and export.

A. Coal mining's public health impacts.

The occupational health impacts of mining coal are well known and must be considered when reviewing the effects of electricity generation with coal. Most of the research on the health effects of coal mining have been performed among miners in large scale mines in Europe and North America.¹⁵⁰

Traumatic injury remains a significant problem and ranges from trivial to the fatal. Coal mining leads U.S. industries in fatal injuries.¹⁵¹ Common causes of fatal injury include rock fall, fires, explosions, mobile equipment accidents, falls from height, entrapment and electrocution.¹⁵² Less common but recognized causes of fatal injury include flooding of underground workings, wet-fill release from collapsed bulkheads and air blast from block caving failure.¹⁵³ Noise is almost ubiquitous in mining; it is generated by drilling, blasting, cutting, materials handling, ventilation, crushing, conveying and ore processing. Controlling noise has proven difficult in mining and noise-induced hearing loss remains common.¹⁵⁴

Coal mining is also associated with chronic health problems among miners, such as Coal Workers' Pneumoconiosis, also known as CWP or "black lung disease," which causes permanent scarring of the lung tissue.¹⁵⁵ A 2002 review of 250 studies on coal mining calculated that up to 12% of coal miners develop the potentially fatal lung condition due to the inhalation of dust during mining operations. Data indicates a direct relationship between the mass of respirable coal mine dust inhaled and the incidence and severity of CWP.¹⁵⁶ The following chain of events has been proposed for the initiation and progression of CWP: (1) inhaled coal dust concentrates at the bifurcations of the respiratory bronchioles; (2) local inflammation results in the accumulation of phagocytic cells that scavenge coal dust particles, forming lung lesions known as coal macules; (3) with further exposure, coal macules enlarge to form coal nodules; (4) as the lesions condense, surrounding tissue is torn forming scar emphysema; and lastly (5) connective tissue becomes associated with these lesions leading to progressive massive fibrosis (PMF).¹⁵⁷

Not only are miners at a higher risk for CWP, but they are also at higher risk for chronic bronchitis and accelerated loss of lung function. As a result, the Federal Coal Mine Health and Safety Act of 1969 legislatively has defined "black lung disease" to include not only CWP but

¹⁵⁰ C. Stephens, M. Ahern, *Worker and Community Health Impacts Related to Mining Operations Internationally. A Rapid Review of the Literature*, London, Mining and Minerals for Sustainable Development Project (2001)

¹⁵¹ See Coal's Assault on Human Health at vi.

¹⁵² A.M. Donoghue, *Occupational Health Hazards in Mining: An Overview*, Occupational Medicine 283 (2004)

¹⁵³ *Id.*

¹⁵⁴ *Id.*

¹⁵⁵ See generally R.K. Pachauri & A. Reisinger (eds), *Climate Change 2007--Synthesis Report: Contribution of Working Groups I, II, and III to the Fourth Assessment Report of the IPCC* (2007); C. Stephens, et al.,; E. Burt, et al., *Health Effects from Coal Use*; Coal's Assault on Human Health.

¹⁵⁶ W.M. Walton et al., *The Effect of Quartz and Other Non-Coal Dusts in Coal Workers' Pneumoconiosis: Part I*, Walton, W.H. (ed) Inhaled Particles IV 669-700 (1977)

¹⁵⁷ R. Finkelman et al., *Health Impacts of Coal and Coal Use: Possible Solutions*, International Journal of Coal Geology 50, at 438 (2002).

also obstructive lung diseases, such as chronic bronchitis and emphysema, as well as silicosis associated with an employment history in coal mines.¹⁵⁸ Inhalation of coal mine dust is associated with the development of pulmonary disease in miners, and coal miners have also been reported to have a higher than normal incidence of stomach cancer.¹⁵⁹

Threats to the public health persist even after removal of coal from a mine. Surface mining destroys forests and groundcover, leading to flood-related injury and mortality, as well as soil erosion and the contamination of water supplies. When mines are abandoned, rainwater reacts with exposed rock to cause the oxidation of metal sulfide minerals. This reaction releases iron, aluminum, cadmium, and copper into the surrounding water system and can also contaminate drinking water.

Before coal can be transported to power plants, it must be washed to remove soil and rock impurities. Coal washing uses polymer chemicals and large quantities of water and creates a liquid waste called slurry. Slurry ponds can leak or fail, leading to injury and death, and slurry injected underground into old mine shafts can release arsenic, barium, lead, and manganese into nearby wells, contaminating local water supplies.¹⁶⁰

Once coal is mined and washed, it must be transported to power plants via truck, ship, barge or train. Railroad engines and trucks together release over 600,000 tons of nitrogen oxide and 50,000 tons of particulate matter into the air every year in the process of hauling coal, largely through diesel exhaust.¹⁶¹ Coal trains and trucks also release coal dust into the air, exposing nearby communities to dust inhalation. There are essentially six potential local environmental effects of concern related to coal transportation: (1) emission of particulate matter in the form of coal dust; (2) emission of particulate matter in the form of diesel locomotive exhaust; (3) production of noise and vibration by train movement; (4) congestion and collisions along roadways and rail lines; (5) train derailments; and (6) fires due to spontaneous combustion of coal.¹⁶²

In addition to the miners themselves, communities near coal mines may be adversely affected by mining operations due to the effects of blasting, the collapse of abandoned mines, and the dispersal of dust from coal trucks. These impacts are discussed at length in the subsequent sections.

B. Coal combustion emissions' impact on public health.

The combustion phase of coal's life-cycle exacts the greatest toll on human health. Most of coal's health burden results from its combustion in power plants, with the rest of the health burden consisting of the effects caused from the other steps of the coal's life-cycle. Pollutants

¹⁵⁸ *Id.*

¹⁵⁹ *Id.* at 440.

¹⁶⁰ See A. Lockwood, et al., *Coal's Assault on Human Health* at 4; E. Burt, et al., *Health Effects from Coal Use* at 3.

¹⁶¹ D.A. Lashof, D. Delano, J. Devine, et al., *Coal in A Changing Climate*, Natural Resources Defense Council (2007), available at: <http://www.nrdc.org/globalwarming/coal/coalclimate.pdf>

¹⁶² Multnomah County Health Department, *The Human Health Effects of Rail Transport of Coal Through Multnomah County, Oregon: A Health Analysis and Recommendations for Further Action*, Health Assessment and Evaluation (2013).

generated by coal combustion can have profound effects on the health of local communities, especially vulnerable individuals including children, the elderly, pregnant women, and those suffering from asthma and lung disease. On a global scale, coal emissions can travel long distances, even affecting populations living remote from power plants.

The "external costs" of electricity generation from coal are the burdens to society that are not included in the electricity's monetary price. Estimates of the external costs of electricity generation from coal suggest that 95% of the external cost consists of the adverse health effects on the population.¹⁶³ When coal is burned, it produces air-borne pollutants of sulfur dioxide, particulate matter (PM), nitrogen oxides, mercury, arsenic, chromium, nickel, and other heavy metals, acid gases, hydrocarbons, and dozens of other substances known to be hazardous to human health.¹⁶⁴ It also contributes to smog through the release of oxides of nitrogen, which react with volatile organic compounds (VOCs) in the presence of sunlight to produce ground-level ozone, the primary ingredient in smog. In 2011, the World Health Organization compiled air quality data from 1,100 cities in 91 countries and found that residents living in many urban areas are exposed to persistently elevated levels of fine particle pollution, partly due to coal-fired power plants, as well as the burning of coal for cooking and heating.¹⁶⁵

A 2007 article published in the medical journal, *The Lancet*, summarizes the burden of the health effects of generating electricity from coal and lignite (a type of coal). It estimated that for every TWh (Terrawatt-hour) of electricity produced from coal in Europe, there are 24.5 deaths, 225 serious illnesses including hospital admissions, congestive heart failure and chronic bronchitis, and 13,288 minor illnesses.¹⁶⁶ When lignite, the most polluting form of coal, is used, each TWh of electricity produced results in 32.6 deaths, 298 serious illnesses, and 17,676 minor illnesses.¹⁶⁷ To give these data perspective, consider the fact that nearly half of the 4,160 TWh of electricity generated in the United States in 2007 came from coal-fired power plants.¹⁶⁸ If these estimates are applied to the U.S., as many as 50,000 deaths per year may be attributable to burning coal.¹⁶⁹

The major health effects linked to coal combustion emissions damage the respiratory, cardiovascular, and nervous systems and contribute to four of the top five leading causes of death in the United States: heart disease, cancer, stroke, and chronic lower respiratory diseases.¹⁷⁰ Although it is difficult to ascertain the proportion of this disease burden that is attributable to coal pollutants, even very modest contributions to these major causes of death are likely to have large effects at the population level, given high incidence rates.

¹⁶³ E. Burt, et al., *Health Effects from Coal Use* at 4.

¹⁶⁴ *See id.* at 3.

¹⁶⁵ *Tackling the Global Clean Air Challenge*, News Release, World Health Organization (Sept. 2011).

¹⁶⁶ A. Markandya & P. Wilkinson, *Energy and Health 2: Electricity Generation and Health*, *The Lancet* 979-990 (2007)

¹⁶⁷ *Id.*

¹⁶⁸ *Id.*

¹⁶⁹ A. Lockwood, et al., *Coal's Assault on Health* at 2.

¹⁷⁰ *See generally* E. Burt, et al., *Health Effects from Coal Use*; A. Lockwood, et al., *Coal's Assault on Human Health* 1.

1. Respiratory Effects

Specific pollutants from burning coal that cause a negative health effect on the respiratory system include particulate matter (PM), sulfur dioxide (SO₂), and oxides of nitrogen, such as NO₂.

Particulate Matter -- Particulate matter is generated from the combustion of coal and is characterized by size -- small particles less than 2.5 micrometers (PM_{2.5}) and larger particles up to 10 micrometers (PM₁₀). PM_{2.5} travels deeper into the airways than PM₁₀ and is therefore generally believed to cause a greater threat to human health.¹⁷¹ In a report evaluating over 40 studies on the health effects of exposure to small particulate matter (PM_{2.5}), the U.S. Environmental Protection Agency concluded that PM_{2.5} likely causes respiratory symptoms, the development of asthma, and decrements in lung function in children.¹⁷² Findings from the review conclude that a 10 µg/m³ increase in PM_{2.5} is associated with a 1% to 3.4% decrease in FEV₁, a measure of lung function, in asthmatic children.¹⁷³ It also concluded that exposure to PM_{2.5} increases emergency department visits and hospital admissions for respiratory related symptoms such as infections and chronic obstructive pulmonary disease.¹⁷⁴ Epidemiological evidence from Australia and New Zealand, Mexico, Canada, and Europe confirm that these health effects on the respiratory system are seen around the globe among communities exposed to PM_{2.5}.¹⁷⁵ In addition to respiratory illnesses, long-term exposure to PM_{2.5} is causally linked to the development of lung-cancer. [Implementing the final emission guidelines of the Clean Power Plan may lead to reductions in ambient PM_{2.5} concentrations below the NAAQS for PM and ozone in some areas and assist other areas with attaining these NAAQS.]¹⁷⁶

Sulfur Dioxide -- Exposure to sulfur dioxide (SO₂) emitted by coal burning power plants increases the severity and incidence of respiratory symptoms of those living nearby, particularly children with asthma.¹⁷⁷ For adults and children who are susceptible, inhalation of SO₂ causes inflammation and hyper-responsiveness of the airways, aggravates bronchitis, and decreases lung function. There is a significant association between community-level SO₂ concentration and hospitalizations for asthma and other respiratory conditions, and asthma emergency department visits particularly among children and adults over 65.¹⁷⁸ The EPA identified three short-term morbidity endpoints

¹⁷¹ See E. Burt, et al., *Health Effects from Coal Use* at 5.

¹⁷² U.S. Environmental Protection Agency, *Integrated Science Assessment for Particulate Matter* (Dec. 2009).

¹⁷³ *Id.*

¹⁷⁴ *Id.*

¹⁷⁵ A.G. Barnett, et al., *Air Pollution and Child Respiratory Health: A Case-Crossover Study in Australia and New Zealand*, *Am. J. of Resp. Crit. Care Med.* (2005); A. Barraza-Villarreal, et al., *Air Pollution, Airway Inflammation, and Lung Function in a Cohort Study of Mexico City Schoolchildren*, *Environ. Health Persp.* (2008); Y. Chen, et al., *Influence of Relatively Low Level of Particulate Air Pollution on Hospitalization for COPD in Elderly People*, *Inhal Toxicol.* (2004); J. De Hartog, et al., *Effects of Fine and Ultrafine Particles on Cardiorespiratory Symptoms in Elderly Subjects with Coronary Heart Disease: The ULTRA Study*, *Am. J. Epidemiol.* (2003).

¹⁷⁶ *Regulatory Impact Analysis for the Clean Power Plan Final Rule*, U.S. Environmental Protection Agency (Aug. 2015) available at: <https://www.epa.gov/sites/production/files/2015-08/documents/cpp-final-rule-ria.pdf>

¹⁷⁷ See E. Burt, et al., *Health Effects from Coal Use* at 6.

¹⁷⁸ *Integrated Science Assessment for Sulfur Oxides – Health Criteria*, U.S. Environmental Protection Agency (2008).

that the SO₂ ISA identified as "causal relationship": asthma exacerbation, respiratory-related emergency department visits, and respiratory-related hospitalizations.¹⁷⁹

Oxides of Nitrogen -- Oxides of nitrogen (NO_x) are by-products of fossil fuel combustion from automobiles and coal-fired power plants, among many other sources. Oxides of nitrogen react with chemicals in the atmosphere to create pollution products such as ozone (smog), nitrous oxide (N₂O), and nitrogen dioxide (NO₂). NO₂ and ozone are pollutants of particular concern. When asthmatic children are exposed to NO₂ they can experience increases in wheezing and cough.¹⁸⁰ Exposure to NO₂ also increases susceptibility to viral and bacterial infections, and at high concentrations (1-2 ppm), it can cause airway inflammation.¹⁸¹ At low concentrations (0.2 - 0.5 ppm) NO₂ causes decrements in lung function in asthmatics.¹⁸² Increases in ambient NO₂ levels (3-50 ppb) cause increases in hospital admissions and emergency department visits for respiratory causes, particularly asthma. Depending on localized concentrations of volatile organic compounds, reducing NO_x emissions would also reduce human exposure to ozone and the incidence of ozone-related health effects.¹⁸³

Reducing emissions of SO₂ and NO_x would also reduce human exposure to ambient PM_{2.5} and the incidence of PM_{2.5}-related health effects.¹⁸⁴ In 2008, the National Academies of Sciences issued a series of recommendations to the EPA regarding the quantification and valuation of ozone-related short-term mortality. Chief among these was that "...short-term exposure to ambient ozone is likely to contribute to premature deaths" and the committee recommended that "ozone-related mortality be included in future estimates of the health benefits of reducing ozone exposures..."¹⁸⁵

2. Cardiovascular Effects

Coal-fired power plants contribute to the global burden of cardiovascular disease primarily through the emission of particulate matter. PM_{2.5} has been causally linked to cardiovascular disease and death.¹⁸⁶ The World Health Organization (WHO) estimates that worldwide, 5% of cardiopulmonary deaths are due to particulate matter pollution.¹⁸⁷ Long term exposure to PM_{2.5} has been shown to accelerate the development of atherosclerosis and increase emergency department visits and hospital admissions for ischemic heart disease and congestive heart failure.¹⁸⁸ The U.S. EPA reports that a majority of the studies it reviewed found a 0.5-2.4% increase in emergency department

¹⁷⁹ See Regulatory Impact Analysis at 4-53.

¹⁸⁰ *Integrated Science Assessment for Oxides of Nitrogen-Health Criteria*, U.S. Environmental Protection Agency (July 2008).

¹⁸¹ See *id.*

¹⁸² See *id.*

¹⁸³ *Id.*

¹⁸⁴ See Regulatory Impact Analysis at 4-11.

¹⁸⁵ *Id.* at 4-17, 4-18.

¹⁸⁶ See *Integrated Science Assessment for Particulate Matter*.

¹⁸⁷ *Global Health Observatory (GHO): Outdoor Air Pollution*, World Health Organization (2003) available at: http://www.who.int/gho/phe/outdoor_air_pollution/en/index.html.

¹⁸⁸ See E. Burt, et al., *Health Effects from Coal Use*, at 7.

visits and hospital admissions for cardiovascular diseases per each 10 µg/m³ increase in PM_{2.5} concentrations,¹⁸⁹ and a 2007 scientific review of the health effects of combustion emissions reported an 8-18% increase in cardiovascular deaths per 10 µg/m³ increase in PM_{2.5} concentration in the United States.¹⁹⁰

3. Neurological Effects

Coal contains many naturally-occurring heavy metals, including mercury. When coal is burned, mercury is emitted into the atmosphere in gaseous form. The United Nations estimates that 26% of global mercury emissions (339-657 metric tons/ year) come from the combustion of coal in power plants.¹⁹¹ The mercury emitted into the atmosphere is deposited into waterways, converted to methylmercury, and passed up the aquatic food chain. Consumption of methylmercury-contaminated fish, from mercury emissions locally, regionally, and internationally, by pregnant women can cause developmental effects in their offspring such as lower intelligence levels, delayed neurodevelopment, and subtle changes in vision, memory, and language.¹⁹²

4. Reproductive Health Effects

The National Academy of Sciences concluded that "the population with the highest risk is the children of women who consumed large amounts of fish and seafood during pregnancy. The committee concludes that the risk to that population is likely to be sufficient to result in an increase in the number of children who have to struggle to keep up in school."¹⁹³ The evidence of air pollution's effects on pregnancy is sufficient to conclude that exposure to air pollution during pregnancy can cause low birthweight.¹⁹⁴ Researchers have studied the association between electricity generation from coal-fired power plants and infant mortality, and infant mortality was shown to increase with increased coal consumption in countries that had mid to low infant mortality rate at baseline (1965).¹⁹⁵

5. Climate change health effects

¹⁸⁹ See *Integrated Science Assessment for Particulate Matter*.

¹⁹⁰ J. Lewtas, *Air Pollution Combustion Emissions: Characterization of Causative Agents and Mechanisms Associated with Cancer, Reproductive, and Cardiovascular Effects*, Mut. Res. 636:95 (2007)

¹⁹¹ J. Pacyna, et al., *Study on Mercury Sources and Emissions and Analysis of Cost and Effectiveness of Control Measures: "UNEP Paragraph 29 Study"*, UNEP (Nov. 2010).

¹⁹² World Health Organization, *Exposure to Mercury: A Major Public Health Concern*, Pub. Health & Env. (2007)

¹⁹³ National Research Council (NRC), *Toxicological Effects of Methylmercury* (2000).

¹⁹⁴ See E. Burt, et al., *Health Effects from Coal Use* at 7.

¹⁹⁵ J. Gohlke, et al., *Estimating the Global Public Health Implications of Electricity and Coal Consumption*, Env. Health Perspect. 119(6) (June 2011)

Pollution from the life-cycle of coal is one of the leading causes of climate change.¹⁹⁶ Climate change itself is a significant threat to human health and well-being.¹⁹⁷ The health impacts of climate change include harms from increasing heat stress and other extreme weather events, increases in air pollution, the spread of vector-borne diseases, food insecurity and under-nutrition, changing exposure to toxic chemicals, displacement, and stress to mental health and well-being.¹⁹⁸ Although everyone is vulnerable to health impacts from climate change, certain groups are particularly vulnerable to climate change-related health harms such as children, the elderly, low-income communities, some communities of color, immigrant groups, and persons with disabilities and pre-existing medical conditions.¹⁹⁹ The 2015 Lancet Commission on Health and Climate Change highlighted that climate change is causing a global medical emergency, concluding that “the implications of climate change for a global population of 9 billion people threatens to undermine the last half century of gains in development and global health.”²⁰⁰

Climate change-driven health impacts are already occurring in the United States, particularly due to morbidity and mortality from extreme weather events which are increasing in frequency and intensity.²⁰¹ Heat is already the leading cause of weather-related deaths in the United States, and extreme heat is projected to lead to increases in future mortality on the order of thousands to tens of thousands of additional premature deaths per year across the United States by the end of this century.²⁰² Extreme precipitation events have become more common in the United States, contributing to increases in severe flooding events in some regions.²⁰³ Floods are the second deadliest of all weather-related hazards in the United States and can lead to drowning, contaminated drinking water leading to disease outbreaks, and mold-related illnesses.²⁰⁴

¹⁹⁶ Intergovernmental Panel on Climate Change Fifth Assessment Report Chapter 7, *Energy Systems*. pg 554.

¹⁹⁷ Luber, G. et al. 2014: Ch. 9: *Human Health. Climate Change Impacts in the United States: The Third National Climate Assessment*. J. M. Melillo, Terese (T.C.) Richmond, and G. W. Yohe, Eds., U.S. Global Change Research Program, 220-256. doi:10.7930/J0PN93H5. See also Watt, N. et al. 2015. *Health and climate change: policy responses to protect public health*. The Lancet 386: 1861-1914.

¹⁹⁸ Sheffield, P. and Landrigan, P.J. 2011. *Global Climate Change and Children’s Health: Threats and Strategies for Prevention*. Environmental Health Perspectives 119: 291-298..

¹⁹⁹ See *Id.* See also USGCRP [US Global Change Research Program]. 2016. *The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment*. Crimmins, A., J. Balbus, J.L. Gamble, C.B. Beard, J.E. Bell, D. Dodgen, R.J. Eisen, N. Fann, M.D. Hawkins, S.C. Herring, L. Jantarasami, D.M. Mills, S. Saha, M.C. Sarofim, J. Trtanj, and L. Ziska, Eds. U.S. Global Change Research Program, Washington, DC, 312 pp. <http://dx.doi.org/10.7930/J0R49NQX>.

²⁰⁰ Watt, N. et al. 2015. *Health and climate change: policy responses to protect public health*. The Lancet 386: 1861-1914.

²⁰¹ See *Id.* See also Luber, G. et al. 2014: Ch. 9: *Human Health. Climate Change Impacts in the United States: The Third National Climate Assessment*. J. M. Melillo, Terese (T.C.) Richmond, and G. W. Yohe, Eds., U.S. Global Change Research Program, 220-256. doi:10.7930/J0PN93H5; USGCRP [US Global Change Research Program]. 2016. *The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment*. Crimmins, A., J. Balbus, J.L. Gamble, C.B. Beard, J.E. Bell, D. Dodgen, R.J. Eisen, N. Fann, M.D. Hawkins, S.C. Herring, L. Jantarasami, D.M. Mills, S. Saha, M.C. Sarofim, J. Trtanj, and L. Ziska, Eds. U.S. Global Change Research Program, Washington, DC, 312 pp. <http://dx.doi.org/10.7930/J0R49NQX>.

²⁰² See USGCRP, 2016. *The Impacts of Climate Change on Human Health in the United States*.

²⁰³ See Luber, G. et al. 2014: Ch. 9: *Human Health. Climate Change Impacts in the United States*.

²⁰⁴ See *Id.*

Air pollution components, specifically ozone, air particulates, and allergens, are expected to increase with climate change. 74 Fed. Reg. 66496 §IV.B.1(b). Climate-driven increases in ozone will cause more premature deaths, hospital visits, lost school days, and acute respiratory symptoms.²⁰⁵ Projected climate-related increases in ground-level ozone concentrations in 2020 could lead to an average of 2.8 million more occurrences of acute respiratory symptoms, 944,000 more missed school days, and over 5,000 more hospitalizations for respiratory-related problems.²⁰⁶ In 2020, the continental U.S. could pay an average of \$5.4 billion (2008\$) in health impact costs associated with the climate penalty on ozone, with California experiencing the greatest estimated impacts averaged at \$729 million.²⁰⁷

Risks from infectious diseases are also increasing as climate change alters the geographic and seasonal distribution of vector-borne diseases.²⁰⁸ Climate change favors the spread of some pathogen-carrying vectors. Lyme disease is the most common vector-borne disease in the United States, with 25,000–30,000 cases reported to the CDC per year, with the highest incidence among children between ages 5 and 9.²⁰⁹ The risk of human exposure to Lyme disease is expected to increase as ticks carrying Lyme disease and other pathogens become active earlier in the season and expand northward in response to warming temperatures.²¹⁰ Rising temperatures and changes in rainfall have already contributed to the maintenance of West Nile virus in parts of the United States, and climate change is expected to increase suitable conditions for the mosquitoes that transmit West Nile virus, increasing human exposure risk to the disease.²¹¹

As highlighted by the Third National Climate Assessment, fighting climate change by reducing greenhouse gas pollution provides critical “opportunities to improve human health and well-being across many sectors,” including a wide array of important health co-benefits.²¹²

The impacts of coal combustion can also be described in economic terms, and several papers have attempted to estimate the cost of using coal by assigning value to the environmental and public health damage caused during each stage of coal’s extraction, transportation, combustion, and disposal. One such study estimated that the external costs of coal-fired electricity in the U.S. add an extra 17.8 cents to each kWh of electricity produced; an amount

²⁰⁵ See USGCRP, 2016. *The Impacts of Climate Change on Human Health in the United States*.

²⁰⁶ UCS [Union of Concerned Scientists]. 2011. *Rising Temperatures and Your Health: Rising Temperatures, Worsening Ozone Pollution*. Available at http://www.ucsusa.org/sites/default/files/legacy/assets/documents/global_warming/climate-change-and-ozone-pollution.pdf.

²⁰⁷ See *Id.*

²⁰⁸ See USGCRP, 2016. *The Impacts of Climate Change on Human Health in the United States*

²⁰⁹ Bernstein, A.S. and S.S. Myers. 2011. *Climate change and children’s health*. *Current Opinion in Pediatrics* 23: 221–6.

²¹⁰ See USGCRP, 2016. *The Impacts of Climate Change on Human Health in the United States*.

²¹¹ Harrigan, R.J., H.A. Thomassen, W. Buermann, and T.B. Smith. 2014. *A continental risk assessment of West Nile virus under climate change*. *Global Change Biology* 20: 2417-2425; Paz, S. 2015. *Climate change impacts on West Nile virus transmission in a global context*. *Philosophical Transactions of the Royal Society B* 370: 20130561.

²¹² See Luber, G. et al. 2014: Ch. 9: *Human Health*. *Climate Change Impacts in the United States*.

that would triple its cost to consumers.²¹³ Another U.S. report by Machol et al. estimates 45 cents per kWh as the cost of the health burden and environmental damages from coal combustion.²¹⁴ In 2011, the US EPA estimated the benefits and costs of the Clean Air Act, a law which regulates emissions of sulfur dioxide, oxides of nitrogen, carbon monoxide, and particulate matter in the United States. The EPA calculated that the ratio of health care cost savings to compliance costs was 25:1 in 2010.²¹⁵ This means that for every dollar spent complying with the Clean Air Act, twenty-five dollars were saved in health care costs due to lower disease burden, including a reduction in premature deaths, and cases of bronchitis, asthma, and myocardial infarction.²¹⁶

C. Coal waste disposal impacts on public health.

The storage of post-combustion wastes from coal plants also threatens human health. After combustion, some coal ash is recycled into cement and other engineering products, but most of it is disposed of in dry or wet landfills.²¹⁷ There are 584 coal ash dump sites in the U.S., and toxic residues have migrated into water supplies and threatened human health at dozens of these sites.²¹⁸ Landfills that leak flyash waste can contaminate ground and surface water with arsenic, cadmium, barium, thallium, selenium, and lead.²¹⁹

The occurrence of uncontrolled coal fires increased following the beginning of coal mining because of the increased amount of coal being exposed to oxygen and because of fires associated with the mining activity as well as accidental and intentional fires started on coal waste piles. Unofficial estimates from the U.S. Office of Surface Mining indicate that, despite many years of concerted efforts to extinguish these fires, there are still approximately 150 uncontrolled surface and underground coal fires in the U.S.²²⁰

D. Coal exports' impact on public health.

The United States produced just under a billion short tons of coal in 2015, but as domestic coal use declines, producers are increasingly looking to export U.S. coal—and the pollution associated with burning this coal—overseas.²²¹ Even though the coal will ultimately be

²¹³ P.R. Epstein, et al., *Full Cost Accounting for the Life Cycle of Coal*, Ann. NY Acad. Sci. (2011)

²¹⁴ B. Machol & S. Rizk, *Economic Value of U.S. Fossil Fuel Electricity Health Impacts*, 52 Env. Intl. 75-80 (2013)

²¹⁵ *The Benefits and Costs of the Clean Air Act: 1990-2020*, U.S. Environmental Protection Agency, Office of Air and Radiation (2010).

²¹⁶ *Id.*

²¹⁷ See E. Burt, et al., *Health Effects from Coal Use* at 3.

²¹⁸ See *Methane as a Greenhouse Gas*, U.S. Climate Change Science Program (2006) available at: <http://www.climate-science.gov/infosheets/highlight1/CCSP-H1-methane18jan2006.pdf>; *Coalbed methane—An Untapped Energy Resource and an Environmental Concern—USGS Fact Sheet*, U.S. Geological Survey, FS-019-97 (1997) available at: <http://energy.usgs.gov/factsheets/Coalbed/coalmeth.html>.

²¹⁹ See E. Burt, et al., *Health Effects from Coal Use* at 3.

²²⁰ R. Finkelman, *Potential Health Impacts of Burning Coal Beds and Waste Banks*, 59 Intl. J. of Coal Geo. 19, 20 (2004).

²²¹ U.S. Energy Information Administration's Coal Use Projections and forecasts found at <https://www.eia.gov/forecasts/steo/report/coal.cfm>; Government Accountability Office, Coal Leasing: BLM Could Enhance Appraisal Process, More Explicitly Consider Coal Exports, and Provide More Public Information 36 (Dec. 2013), GAO-14-140.

burned elsewhere, the mining and transportation of coal for export nonetheless have significant adverse effects on human health and the environment in the United States. Transporting the coal to ports releases coal dust from open rail cars, as well as diesel exhaust from train engines, along the rail lines.²²² Coal dust particles themselves contribute to lung disease, asthma, and cardiopulmonary diseases, and can contain toxic heavy metals like arsenic and lead, which pose additional health risks, such as skin, bladder, liver, and lung cancers and damage to the nervous system.²²³ At the ports, unloading the coal, storage in piles, and reloading it onto ships all emit large quantities of coal dust.²²⁴ Trains and ships used to transport coal also emit diesel exhaust and other harmful air pollutants, which worsen respiratory and pulmonary conditions and can cause premature death.

According to a 1993 Norfolk Southern Rail Emission study, each open car carrying metallurgical coal from mines in Appalachia to the port terminals in Hampton Roads and Baltimore releases roughly 300 pounds coal dust into the air, water, and soil in the communities through which it travels.²²⁵ According to a 2011 Burlington Northern Santa Fe (BNSF) study, each rail car carrying Powder River Basin [thermal] coal loses between 250 and 700 pounds of coal and coal dust on each trip, or over 30 tons of coal for a typical 120-car coal train.²²⁶ BNSF estimates that around 3,600 lbs. per car can be lost in the form of dust.²²⁷

Ports are also a significant source of coal dust. When a train arrives at a coal export terminal, it may dump its coal into an open air storage pile or holding silo. Alternatively, a train arriving at a port terminal may wait for days in a train yard at the port before its coal is unloaded. These waiting train cars and open-air coal piles are significant sources of coal dust particulate matter at export terminals because typical wind speeds and wind gusts prevalent in near-coastal areas cause coal particles from the storage piles and from the uncovered tops of waiting coal cars to be released into the air.²²⁸ Unloading the coal from rail cars into storage piles at the port facility and storing the coal in these piles emits coal dust into the air, soil, and water nearby. In addition, coal dust is carried off the storage piles as runoff when the piles are exposed to rain.²²⁹ This runoff can impact both surface water and underlying groundwater. When a ship is ready for loading, conveyor belts transport the coal from the train car, silo, or coal pile, and dump the coal onto the ship, releasing additional coal dust into the air and water.

Coal dust, once emitted, can have multiple impacts on humans and the environment. Fugitive coal dust that is 10 micrometers or less in diameter is classified as PM10, and fugitive

²²² BNSF Railway. "Coal Cars." Found at <http://www.bnsf.com/customers/equipment/coal-cars/>.

²²³ Center for Disease Control and Prevention. "Coal dust." *NIOSH Pocket Guide to Chemical Hazards*. Nov 18, 2010. Found at <http://www.cdc.gov/niosh/npg/npgd0144.html>.

²²⁴ Burlington Northern Santa Fe Railway, "Coal Dust FAQ," Mar 2011, found at <http://www.coaltrainfacts.org/docs/BNSF-Coal-Dust-FAQs1.pdf>.

²²⁵ Simpson Weather Associates, *Norfolk Southern Rail Emission Study: Consulting Report Prepared for Norfolk Southern Corporation*. Charlottesville, VA (30 December 1993) found at [http://leg2.state.va.us/dls/h&sdocs/nsf/By+Year/SD581994/\\$file/SD58_1994.pdf](http://leg2.state.va.us/dls/h&sdocs/nsf/By+Year/SD581994/$file/SD58_1994.pdf). (appendix E).

²²⁶ See BNSF Coal Dust FAQ.

²²⁷ See *Id.*

²²⁸ Bounds, WJ and Johannesson, KH. "Arsenic addition to soils from airborne coal dust originating at a major coal shipping terminal." *Water, Air, and Soil Pollution* 185 (2007): 195-207.

²²⁹ See *Id.* at 198.

coal dust that is 2.5 micrometers or less in diameter is classified as PM2.5. PM10 can travel up to 30 miles, and PM2.5 can travel 500 miles.²³⁰ Both PM10 and PM2.5 are extremely harmful to human health. The particles can travel deep into the lungs and into the bloodstream, causing premature death in people with heart or lung disease, heart attacks, decreased lung function, and increased respiratory effects, including irritation of the airways, aggravated asthma, coughing, and breathing difficulties.²³¹ Groups that are most at risk due to PM10 and PM2.5 exposure include children, older adults, low-income communities, and individuals with asthma or preexisting heart and lung disease. Inorganic arsenic found in coal dust deposited in soil near coal export terminals is a human carcinogen.²³² Human exposure to inorganic arsenic by inhalation has been strongly associated with lung cancer, and ingestion has been linked to skin, bladder, liver, and lung cancers.²³³ Chronic inhalation has been associated with irritation of the skin and mucous membranes, as well as effects in the brain and nervous system. Gastrointestinal effects, anemia, peripheral neuropathy, skin lesions, hyperpigmentation, and liver or kidney damage have resulted from chronic oral exposure to elevated levels of inorganic arsenic.²³⁴

In addition to coal dust, the trains and ships used to transport coal emit diesel exhaust. Diesel exhaust contains significant sources of harmful air pollutants including particulate matter (PM/PM2.5), volatile organic compounds (VOCs), toxic compounds known as air toxics, carbon monoxide (CO), nitrogen oxides (NOx) and, in the case of ships, sulfur oxides (SOx), and contributes to elevated ozone levels.²³⁵ This pollution causes poor air quality, reduced visibility, water and soil contamination, and ecosystem damage. Health effects associated with exposure to this pollution include premature mortality, increased hospital admissions, heart and lung diseases, asthma, reduced lung function, and increased cancer risk.²³⁶

U.S. coal emissions from combustion overseas, namely in Asia, returns to the U.S. in the form of particulate matter, ozone and mercury deposition. Multiple studies have shown that, depending on the season and meteorological conditions, a significant portion of particulate pollution in California originates in Asia, as well the precursors for ozone, the ozone itself, and gaseous mercury.²³⁷ Indeed, a University of California at Berkeley study found that 29% of particulate matter pollution in the San Francisco Bay area originated from fossil fuel use in China.²³⁸ Another study found that the majority of particulate pollution in Lake Tahoe originated in Asia.²³⁹ Coal's pollution footprint is extremely large, spanning thousands of miles across oceans and continents. The health impacts stemming from this pollution are significant and should be addressed in any environmental review of the federal coal program.

²³⁰ See *Id.* at 200.

²³¹ See Environmental Protection Agency, *Integrated Science Assessment on PM* at 25.

²³² See *Bounds, WJ and Johannesson.KH* at 196.

²³³ World Health Organization Fact Sheet on Inorganic Arsenic found at <http://www.who.int/mediacentre/factsheets/fs372/en/>.

²³⁴ See *Id.*

²³⁵ California EPA's Fact Sheet on Health Impacts of Diesel Exhaust emissions found at: <http://oehha.ca.gov/media/downloads/calenviroscreen/indicators/diesel4-02.pdf>,

²³⁶ See *Id.*

²³⁷ Lin, Jintai, et al. *China's international trade and air pollution in the United States*, Proceedings of the National Academy of Sciences of the United States of American, vol. 111 no. 5, pgs. 1736-1741, January 21, 2014.

²³⁸ Ewing, A. Stephanie, et al., *Pb Isotopes as an Indicator of the Asian Contribution to Particulate Air Pollution in Urban California*, *Environ. Sci. Technol. Journal*, 44 (23), pp 8911–8916. October 29, 2010.

²³⁹ See *Id.*

V. The Impacts of Coal Mining on Species and Habitats

There are myriad environmental impacts from mining coal, transporting it by rail, burning it, and disposing of the resulting waste, all which must be fully analyzed in the EIS. Exploiting coal resources causes a broad array of environmental harms through contamination of air, surface and groundwater, and publicly owned lands.²⁴⁰ The EIS must include an analysis of impacts to biological, marine, and aquatic resources on both public and private lands and waters affected by coal mining, transportation and combustion – that is, in the areas where mining of the coal takes place, through rail or other corridors, through the loading and shipping of the coal, to its final destination, burning, and disposal. Such resources include marine and terrestrial mammals, game and non-game resident and migratory bird species, raptors, songbirds, amphibians, reptiles, fisheries, aquatic invertebrates, wetlands, and vegetative communities – including species listed pursuant to the Endangered Species Act (ESA). For species protected under the ESA, BLM must consult with the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) under § 7 of the Act to determine whether BLM regulated coal mining activities will adversely affect these species or their designated critical habitat.²⁴¹ Because this programmatic decision implicates a significant share of not only domestic but global greenhouse gas emissions whose effects occur globally, the relevant “action area” for purposes of consultation is global.

The BLM must ensure that up-to-date information on all potentially impacted flora and fauna is made available in the Draft PEIS, so that adequate impact analyses can be completed and to ensure robust public participation. Habitat degradation, fragmentation, and loss must all be assessed, along with any resulting impacts to wildlife and marine species. Cumulative impacts, such as increased wildlife mortality from mining related activities (including, but not limited to, increased human conflicts, habitat loss, and increased hunting pressure), transport of coal, pollution from coal combustion, and coal combustion waste disposal, must be fully analyzed. Impacts to wildlife migration corridors must also be evaluated.

The PEIS must also consider all potential water quality impacts (*e.g.*, increased sediment loads, possible spills, coal dust impacts, mercury deposition, changes to alluvial groundwater quality, degradation of drinking well water) and water quantity impacts (*e.g.*, drawdown of aquifers, diversions or diminutions of surface flow, hydrologic changes affecting seeps and springs, drinking water impacts), as well as impacts to water resources that would be expected from burning the coal and disposing of coal combustion waste, whether domestically or overseas, and the impacts that potential alterations in water quality and quantity will have on listed species.

Transportation of coal over long distances also has significant environmental impacts, including the fossil fuel consumption of moving large volumes of material over long distances. Data shows that open coal trains lose huge volumes of coal dust during transportation. Such discharges add to air quality problems along the rail route, and cause contamination of

²⁴⁰ See generally Paul R. Epstein et al, Full cost accounting for the life cycle of coal in “Ecological Economics Reviews,” *Ann. N.Y. Acad. Sci.* 1219: 73-98 (2011); Jayni Foley Hein and Peter Howard, *Illuminating the Hidden Costs of Coal* (Dec. 2015); *A Hidden Cost of Coal*, Northern Plains Resource Council; *Exporting Powder River Basin Coal: Risks and Costs*, Western Organization of Resource Councils (Sept. 2011).

²⁴¹ 16 U.S.C. § 1536(a)(2).

waterbodies and other habitat areas. According to BNSF studies, 500 to 2,000 lbs of coal can be lost in the form of dust for each rail car, and coal trains are typically composed of at least 120 cars per train. In other studies, again according to BNSF, as much as three percent of the coal in each car (around 3,600 lbs per car) can be lost in the form of dust.²⁴² This is a huge volume of coal that will escape into the air and water, potentially affecting many listed species and essential habitat areas, which must be fully analyzed in the EIS. Moreover, as with the greenhouse gas impacts, this analysis must be viewed in the context of all existing and reasonably foreseeable similar impacts.

The PEIS's analysis of coal dust should also include a discussion of the efficacy of surfactants to control coal dust, potential impacts of the use of surfactants to control dust emissions, as well as consequences from not using surfactants. Although use of surfactants in some contexts is common, their efficacy and safety for use on coal-carrying trains is unproven. Further, surfactants contain myriad undisclosed chemicals, many of whose biological and ecological effects have not yet been adequately studied. Surfactants could cause a number of potential harms, including: danger to human health during and after application; surface, groundwater and soil contamination; air pollution; changes in hydrologic characteristics of the soils; and impacts on native flora and fauna populations. *See* Environmental Protection Agency, Potential Environmental Impacts of Dust Suppressants: Avoiding another Times Beach § 3 (May 30-31, 2002).

The net results of the impacts of coal mining have been significant water pollution, loss of natural areas, and great reductions in biological diversity in mined places. We thank BLM for recognizing that the current implementation of the Federal coal program has failed to protect our waterways, wildlife, and natural ecosystems from coal mining and related pollution. We provide the following information to support the need for more protective regulations to ensure that mining operations are conducted so as to minimize disturbances and adverse impacts on fish, wildlife, and related environmental values.

A. Site-Specific Impacts of Mining

In the Notice of Intent to Prepare a Programmatic Environmental Impact Statement, one of the issues that BLM seeks comment on is “how, when and where to lease.” Specifically, the Notice states that the PEIS “will consider whether the BLM’s unsuitability screening criteria adequately address the questions of where and/or where not to lease for coal production, as well as other potential factors that could be applied during the planning process to provide guidance on the most appropriate locations for coal leasing.” The incredible harm that coal mining has caused to local habitats and communities, and the number of species that have been pushed to the brink of extinction from coal mining activities (discussed below), indicates that the unsuitability screening criteria are not adequately addressing the impacts of coal mining, and more specific and enforceable limitations must be applied to prevent further harm.

As set forth above, it is our position that no further coal mining can be allowed if we are to meet our climate goals, and our remaining coal reserves must be kept in the ground to prevent harm to waterways and habitats; however, in the event that the regulations will continue to allow

²⁴² Hearing Transcript, July 29, 2010, *Arkansas Electric Cooperative Association – Petition for Declaratory Order*, Surface Transportation Board, Docket No. FD 35305, at 42:5-13.

for the exploitation of this dirty, dangerous fossil fuel resource, below we have provided our concerns over the unsuitability screening criteria, and suggest criteria for determining areas where coal mining should not be allowed.

However, it is not only that the criteria themselves that are inadequate to prevent coal mining from unduly harming our communities and habitats – the implementation of the screening criteria is likewise inadequate. For example, several exemptions allow the criteria to be bypassed. Pursuant to 43 C.F.R § 3461.2-1(a)(1), “each of the unsuitability criteria shall be applied to all coal lands with development potential identified in the comprehensive land use plan or land use analysis;” however, that section adds that “for areas where 1 or more unsuitability conditions are found and for which the authorized officer of the surface management agency could otherwise regard coal mining as a likely use, the exceptions and exemptions for each criterion may be applied.” This broad grant of authority to disregard the applicability of the unsuitability criteria in cases where coal mining is somehow still considered a “likely use” is dangerous, especially without any indication of the factors that would be used to determine its applicability. Allowing lands to be mined even when the unsuitability criteria suggest it should not be, simply because some “authorized officer” thinks that coal mining is a “likely use,” provides nothing other than a means for mining companies to exert influence on the agency in an attempt to disregard the criteria intended to protect sensitive areas from harm. This provision must be changed such that no mining is allowed on lands that have been shown to be unsuitable.

Furthermore, 43 C.F.R § 3461.2-1(b)(1) allows the “authorized officer” to make that assessment “on the best available data that can be obtained given the time and resources available to prepare the plan.” This standard falls well short of what is normally used to ensure that environmental resources are not unduly adversely impacted. Under both the ESA and NEPA, the standard is to use the “best available science.”²⁴³ The limitation provided in 43 C.F.R § 3461.2-1(b)(1) regarding time and resources, however, is a slippery slope that would allow decisions to be made based on incomplete and unreliable information - especially given the fact that resources at both the state and federal level for gathering data to support studies regarding the impacts of coal mining on the environment are entirely lacking. The regulations also do not require that all relevant information be used in BLM’s analysis. 43 C.F.R § 3461.2-1 states that “land use analysis shall include an indication of the adequacy and reliability of the data involved;” however, the regulation does not prohibit BLM from making a determination if the information is incomplete, but rather allows BLM to determine that a criterion “cannot be applied” due to “inadequate or unreliable data,” and then merely requires that the “analysis [] discuss the reasons therefor and disclose when the data needed to make an assessment with reasonable certainty would be generated.” This provision allows decisions to be made without sufficient information or regard for environmental impacts, and is therefore precarious when we must be precautionary.

A provision that states emphatically that decisions must be based on the best available science, and that no mining may be allowed absent sufficient information on the potential impacts on human health and the environment, is necessary to prevent the devastating harm that coal mining has already caused and will continue to cause if more enforceable restrictions are not

²⁴³ See 16 U.S.C. § 1536(a)(2).

employed. NEPA, for example, requires agencies to gather information where there is incomplete information essential to making a determination of impacts.²⁴⁴ If that information cannot be obtained, then BLM should not merely have to disclose the reasons why the data is unavailable and when it could be obtained, but should have to assess the relevance of that information, as required under NEPA,²⁴⁵ and no determination must be made until such information is available.

Furthermore, 43 C.F.R. § 3461.4 allows for exploration on lands that have been deemed unsuitable under the current criteria. This is illogical and dangerous.²⁴⁶ Not only does this allow exploration activities that have the potential to cause harm to the environment and local habitats on lands already deemed unsuitable (potentially because of the presence of features or species that make the area sensitive to such activities), but this provision can only be meant to allow mining companies the opportunity to find economic reserves in order to exert pressure on BLM to release lands already deemed unacceptable by finding some exemption. Encouraging the development of lands that have already been deemed unsuitable for mining is inconsistent with the best interests of the public and can only lead to unnecessary environmental harm.

1. The Unsuitability Screening Criteria

i. Criterion 1

Criterion 1 prevents coal mining on “all Federal lands” including not only obvious areas such as National Parks and wilderness areas, but on all National Forests. This is a reasonable limitation, especially given the fact that sufficient private land exists for coal exploitation, and public lands must be managed under public trust principles, which are inconsistent with the harms to both the local and global environment caused by coal mining. The only way to protect public lands and the species that rely on them from undue harm from coal mining is to prevent these activities on our public lands.

However, there is an exception that swallows this rule. It states that a lease may be issued for mining on National Forest lands if there are “no significant recreational, timber, economic or other values which may be incompatible with the lease, and [] surface operations and impacts are incident to an underground coal mine.” First, that surface impacts are incident to underground mining is meaningless, and does not prevent undue harm to our National Forests. The fact that there is no language about minimizing these incidental impacts to the surface resources is totally unreasonable, given that minimization of impacts is essential to protecting resources. While the regulations provide for BLM to place “particular emphasis” on protecting

²⁴⁴ 43 C.F.R. § 1502.22(a) (“If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement.”).

²⁴⁵ *Id.* at § 1536(b).

²⁴⁶ For example, the regulations state that all areas within 300 feet of any public building, school, church, community or institutional building or public park or within 300 feet of an occupied dwelling are unsuitable, yet this provision would allow exploration in these sensitive areas regardless.

certain environmental resources,²⁴⁷ a more specific requirement that harm be minimized should be included at the very least.

Second, this exception provides too much leeway for the decision to allow mining on National Forest lands. Whether there are “values” that are inconsistent or incompatible with the lease is a very broad, undefined inquiry. As discussed above, the “value” attributable to preventing further climate harm should outweigh all economic basis for allowing further coal mining; however, apparently this provision has not been properly employed, since coal mining continues to occur, regardless of the impacts. Further, this provision ignores impacts to habitats and species, focusing instead on the economic values associated with National Forests, such as timber and recreation. This provision should be broadened to include habitat, such that mining on National Forest lands may not be allowed if such activities are incompatible with the habitat needs of species that rely on those areas – particularly species protected under state and/or federal law, or that have been otherwise identified as imperiled.

ii. Criterion 3

Criterion 3 provides that lands within 100 feet of the outside line of the right-of-way of a public road or within 100 feet of a cemetery, or within 300 feet of any public building, school, church, community or institutional building or public park or within 300 feet of an occupied dwelling are unsuitable. While providing strict buffers for these sensitive areas is warranted (and the same must be done for environmental resources as well, such as streams), the distances provided here are insufficient to protect our communities. This provision allows coal mining within 300 feet (just one football field) of a school or home. Based on what we now know about the harmful effects of mining on local communities, including both water impacts from the release of pollutants and air impacts from toxic coal dust, a much larger buffer (i.e. 500 feet or more) should be employed.²⁴⁸

iii. Criterion 4

Criterion 4 states that “Federal lands designated as wilderness study areas shall be considered unsuitable while under review by the Administration and the Congress for possible wilderness designation. For any Federal land which is to be leased or mined prior to completion of the wilderness inventory by the surface management agency, the environmental assessment or

²⁴⁷ See 43 CFR 3420.1-4(e)(3) (“In making these multiple use decisions, the Bureau of Land Management or the surface management agency conducting the land use planning shall place particular emphasis on protecting the following: Air and water quality; wetlands, riparian areas and sole-source aquifers; the Federal lands which, if leased, would adversely impact units of the National Park System, the National Wildlife Refuge System, the National System of Trails, and the National Wild and Scenic Rivers System.”).

²⁴⁸ The public health issues raised by coal extraction, transportation and use include increased air pollution from coal dust (mercury, arsenic, lead, uranium), soil contamination by coal dust, and increased noise. The EIS should include a specific focus on children, the elderly, and other vulnerable members of the community. Air quality impacts and pollution from nitrogen dioxide (NO₂), particulate matter, and coal dust must be analyzed. NO₂ exposure can have a wide range of health impacts depending on the length of exposure and various other factors. Epidemiologic research establishes a plausible relationship between NO₂ exposures and adverse health effects ranging from the onset of respiratory symptoms to hospital admission. Particulate matter (PM) refers to a broad class of diverse substances that exist as discrete particles of varying size. Environmental Protection Agency, Integrated Science Assessment for Particulate Matter, 4-2. EPA/600/R-08/139F, December 2009, 76 Fed. Reg. 57105 at 57302; Exh. 147, Health Effects and Economic Impacts of Fine Particle Pollution in Washington, Washington Dep’t of Ecology (Dec. 15, 2009).

impact statement on the lease sale or mine plan shall consider whether the land possesses the characteristics of a wilderness study area. If the finding is affirmative, the land shall be considered unsuitable....”

This provision, while protecting areas that have been designated for potential inclusion into wilderness areas, leaves too many sensitive areas open to coal mining activities. The provision should apply not only to wilderness study areas and those areas with wilderness characteristics, it should also include all inventoried roadless areas, as well as other large habitat blocks that are vital to species that rely on intact habitat.

Habitat fragmentation is one of the biggest threats to biodiversity.²⁴⁹ Maintaining large habitat blocks is not only essential for the species that rely on them, but for all species to adapt and adjust to climate change. Given that coal is rapidly becoming an obsolete source of energy – mostly because we now know that exploiting coal resources is horrible for the environment – there is absolutely no reason to continue to allow mining activities in areas that would cause greater habitat fragmentation or otherwise adversely affect large habitat blocks. The revamped program should therefore provide that intact habitat blocks (i.e. greater than __ acres) must be protected, and any lands where mining activities would contribute to fragmentation are unsuitable.

iv. Criterion 6

Pursuant to criterion 6, “Federal lands under permit by the surface management agency, and being used for scientific studies involving food or fiber production, natural resources, or technology demonstrations and experiments shall be considered unsuitable for the duration of the study, demonstration or experiment....” It is not clear whether “natural resources” is intended to cover studies regarding habitat or species, but it should be made clear that such studies – especially those involving habitat needs and the impacts of mining on species or waterways – would also render lands unsuitable.

v. Criterion 9

Criterion 9 states that designated or proposed critical habitat for listed species, and habitat for such species which is determined to be of essential value and where the presence of threatened or endangered species has been scientifically documented, shall be considered unsuitable. While this should be the end of it, and no coal mining activities should ever be allowed to take listed species or adversely modify essential or critical habitat, there is an exception in Criterion 9 that not only swallows the rule, it chews it up and spits it out.

²⁴⁹ See e.g. U.S. DEPARTMENT OF THE INTERIOR, DRAFT STREAM PROTECTION RULE ENVIRONMENTAL IMPACT STATEMENT 4-95 (2015) (stating that the removal of trees and habitat fragmentation associated with coal mining “may cause species to become threatened or endangered, and can contribute to species extinction”); *Id.* at 4-113 (“The negative effects of mining on specific features of habitats (soils, topography, water quality, and vegetation) may make it more difficult for wildlife species to reestablish after a mining disturbance and may increase the proliferation of non-native species on reclaimed landscapes.”); *Nat’l Parks Conservation Ass’n v. Jewell*, 62 F. Supp. 3d 7, 16 (D.D.C. 2014) (noting that “[d]irect effects of surface coal mining and reclamation operations on threatened, endangered, or proposed species or critical habitat consists [sic] primarily of habitat alteration by land clearing and earthmoving operations.... If a species of concern lacks individual mobility, land clearing and excavation activities may result in a direct take”).

The exception states that a “lease may be issued and mining operations approved if, after consultation with the Fish and Wildlife Service, the Service determines that the proposed activity is not likely to jeopardize the continued existence of the listed species and/or its critical habitat.”

There are several problems with this exception. The first is that while site-specific consultation may result in measures to reduce or avoid harm to species, that process fails to provide a holistic analysis of the cumulative impacts caused by coal mining activities.

The second is that consultation often does not take place on specific mining projects regulated under SMCRA, due to a 1996 Biological Opinion, which covers all take of all listed species, for all time (including future listed species) from impacts associated with coal mining.²⁵⁰ The Service relies on this BiOp to find that individual mines will not jeopardize listed species absent site-specific analysis, yet mining activities continue to drive species to the brink of extinction. This is due, in part, to the reliance on Protection and Enhancement Plans (PEPs), which are intended to implement measures to mitigate take, such that mining activities will not jeopardize species in violation of Section 7 of the ESA. However, FWS has only provided PEP Guidance for some listed species, such as the Indiana bat and blackside dace, but not for all species that may be directly and indirectly impacted by surface and/or underground coal mining of federal coal. Endangered or threatened species directly affected by existing or proposed mines on federal coal leases include but not limited to:²⁵¹

Ute ladies’-tresses	blowout penstemon
Gunnison sage-grouse	Mexican spotted owl
Southwestern willow flycatcher	Yellow-billed cuckoo
Greenback cutthroat trout	Pawnee montane skipper
Canada lynx	Preble’s meadow jumping mouse
DeBeque phacelia	Penland alpine fen mustard
Colorado hookless cactus	bonytail chub
humpback chub	razorback sucker
Colorado pikeminnow	Utah prairie dog
gray bat	Virginia Big-eared bat
dusktail darter	palezone shiner
Cumberland darter	Cumberland elktoe
Fanshell	Cumberlandian combshell
oyster mussel	tan riffleshell
snuffbox	pink mucket
little-wing pearlymussel	Cumberland bean pearlymussel
Cumberland sandwort	Cumberland Rosemary

²⁵⁰ 1996 Biological Opinion and Conference Report on Surface Coal Mining and Reclamation Operations under SMCRA (hereafter “1996 Biological Opinion”).

²⁵¹ See BLM, Final Environmental Impact Statement for the Wright Area Coal Lease Applications 3-188 (July 2010); USDA Forest Service, Rulemaking for Colorado Roadless Areas, Supplemental Draft Environmental Impact Statement 21 (Sept. 2015); BLM, Draft Environmental Impact Statement, Alton Coal Tract Lease By Application at 3-83 (Nov. 2011); BLM and USFS, Environmental Assessment, Bledsoe Coal Lease, KYES-53865 (Oct. 2012), available at http://www.blm.gov/style/medialib/blm/es/minerals/coal/coal_lease_sales_nepa.Par.46357.File.dat/BledsoeCoalLease.EA.12Oct2012.LowResolu.pdf.

American chaffseed	white-haired goldenrod
Virginia spiraea	running Buffalo clover

Absent site-specific consultation and PEPs that actually implement protections for species, it is impossible for mine operators to “minimize disturbances and adverse impacts on fish and wildlife and related environmental values, including compliance with the Endangered Species Act....”²⁵² Further, even where the agencies do not rely on the 1996 BiOp and do conduct consultations, history has shown that this has not worked to protect imperiled species. Data published since 1996 document increasingly significant declines in numerous imperiled and federally protected taxa, and degradation of their habitats, as the result of surface coal mining.²⁵³

Recent scientific and policy documents further show that surface mining is increasingly imperiling numerous species of many taxa, contrary to the conclusions of the 1996 Biological Opinion, and perhaps specifically because OSM and FWS have failed to properly implement and oversee the implementation of the requirements of the 1996 Biological Opinion.²⁵⁴ It is therefore clear that this criterion is failing to ensure the protection of listed species.

As discussed above, there is no reason to allow coal mining generally, and even less to allow these activities in areas that support listed or proposed species. This dying industry should not be allowed to drag down with it the imperiled species that rely on lands that coal companies want to exploit for profit. Rather, the standard should be that any land with suitable habitat for listed or proposed species is unsuitable for coal mining, and if an exception must be provided (and there really is no good reason to do so), then the exception should be allowed only if after surveys and studies it has been shown that no habitat for listed or proposed species would be negatively impacted, and a concurrence letter from FWS stating that no take is expected to occur.

vi. Criterion 10

²⁵² 30 C.F.R. § 780.16(b).

²⁵³ Melvin Warren & Wendell Haag, *Spatio-temporal patterns of the decline of freshwater mussels in the Little South Fork Cumberland River, USA*, *Biodiversity and Conservation* 14: 1383–1400 (2005); James Wickham et al., *The effect of Appalachian mountaintop mining on interior forest*, *Landscape Ecology* 22: 179-187 (2007); Douglas Becker, D.A. et al., *Impacts of mountaintop mining on terrestrial ecosystem integrity: identifying landscape thresholds for avian species in the central Appalachians, United States*, *Landscape Ecology* 30: 339- 356 (2015); Emily Bernhardt & Margaret Palmer, *The environmental costs of mountaintop mining valley fill operations for aquatic ecosystems of the Central Appalachians*, *Annals of the New York Academy of Sciences* 1223: 39–57 (2011); Emily Bernhardt et al., *How many mountains can we mine? Assessing the regional degradation of Central Appalachian rivers by surface coal mining*, *Environmental Science and Technology* 46: 8115–8122 (2012).

²⁵⁴ STEVEN AHLSTEDT ET AL., *LONG-TERM TREND INFORMATION FOR FRESHWATER MUSSEL POPULATIONS AT TWELVE FIXED-STATION MONITORING SITES IN THE CLINCH AND POWELL RIVERS OF EASTERN TENNESSEE AND SOUTHWESTERN VIRGINIA 1979-2004*(2005); Nathaniel Hitt & Douglas Chambers, *Temporal changes in taxonomic and functional diversity of fish assemblages downstream from mountaintop mining*, *Freshwater Science* 33(3): 915-926 (2014); Brenee Muncy et al., *Mountaintop removal mining reduces stream salamander occupancy and richness in southeastern Kentucky (USA)*, *Biological Conservation* 180: 115-121 (2014); U.S. ENVIRONMENTAL PROTECTION AGENCY, *THE EFFECTS OF MOUNTAINTOP MINES AND VALLEY FILLS ON AQUATIC ECOSYSTEMS OF THE CENTRAL APPALACHIAN COALFIELDS*, EPA/600/R-09/138F (2011); Gregory Pond, *Patterns of Ephemeroptera taxa loss in Appalachian headwater streams (Kentucky, USA)*, *Hydrobiologia* 641:185–201 (2010); Todd Petty et al., *Landscape indicators and thresholds of stream ecological impairment in an intensively mined Appalachian watershed*, *Journal of the North American Benthological Society* 29(4):1292-1309 (2010); Endangered status for the Cumberland Darter, Rush Darter, Yellowcheek Darter, Chucky Madtom, and Laurel Dace, Final Rule, 76 Fed. Reg. 48,722 (Aug. 9, 2011); Endangered species status for the Big Sandy Crayfish and the Guyandotte River Crayfish, Proposed Rule, 80 Fed. Reg. 18,710 (Apr. 7, 2015).

Criterion 10 states that Federal lands containing critical habitat for state listed plant or animal species shall be considered unsuitable. While in theory this is protective of species, it suffers from some of the same issues as discussed above regarding federally-listed species. In short, this is not being enforced correctly, and the results speak for themselves. Too many species have suffered from coal mining over the past few decades – with many driven to the brink of extinction or extirpated entirely – for anyone to argue that this criterion (or Criterion 9) is doing what it intended. A new rule that does not allow any adverse modification of habitat for any listed species, state or federal, is warranted to ensure that species do not continue to be harmed by a process that allows for wanton destruction of habitat.

It is, in fact, readily apparent that state programs are not being properly enforced. In *West Virginia Highlands Conservancy*, for example, the court detailed the damage done by OSM's refusal to properly oversee the inadequate West Virginia program. It noted many direct impacts and wide ranging indirect impacts, finding:

a climate of lawlessness, which creates a pervasive impression that continued disregard for federal law and statutory requirements goes unpunished, or possibly unnoticed. Agency warnings have no more effect than a wink and a nod, a deadline is just an arbitrary date on the calendar and, once passed, not to be mentioned again. Financial benefits accrue to the owners and operators who were not required to incur the statutory burden and costs attendant to surface mining; political benefits accrue to the state executive and legislators who escape accountability while the mining industry gets a free pass. Why should the state actors do otherwise when the federal regulatory enforcers' findings, requirements, and warnings remain toothless and without effect?²⁵⁵

The Federal coal program is therefore not being properly implemented, which has resulted in undue adverse impacts to habitats and the species that rely on them.

vii. Criteria 12, 14 and 15

Criterion 12 protects bald and golden eagle roost and concentration area used during migration and wintering, and Criterion 14 protects high priority habitat for migratory bird species. While these protective measures are vitally important to these species, it is not clear that they are being properly implemented. As set forth herein, recent history has shown that coal mining has had severe adverse impacts on habitats. It is not clear whether the process that has been put in place to determine those areas that are vital to eagles and other migratory birds is being properly followed.

In order to be sufficiently protective, all concentration areas for eagles and migratory birds used for migration and wintering should be considered unsuitable. Moreover, there should be no exceptions to this rule. As discussed above, sacrificing any of these essential habitat areas in order to exploit coal resources is illogical and unconscionable. We must move beyond coal now, and cannot allow this dying industry to continue to cause undue adverse harm.

²⁵⁵ *West Virginia Highlands Conservancy v. Norton*, 161 F. Supp. 2d 676, 684 (S.D. W.V. 2001).

However, we do note that these criteria contain important protections that should apply likewise to other species. Areas where species congregate or that contain high biodiversity and unique habitats must be protected, for current and future generations. Furthermore, the notion that we must protect roost and concentration areas for migration and wintering should be applied to ESA species as well. Criterion 9 protects critical habitat; however, not all listed species have designated critical habitat. Therefore, we urge that these protections be extended, such that all lands that are relied on by listed species, as well as those that contain important habitat areas for other species, are not despoiled by mining activities. This should include not just those areas that species currently rely on, but also those areas that are important for habitat connectivity, which is essential for climate resilience (i.e. species must be able to adapt to climate change, which in many cases requires north/south movement to maintain habitat niches as areas are altered by climate change).

Furthermore, the focus must be not only on the immediate area, but on the entire area impacted by coal mining activities. This is especially important for impacts to sensitive river systems and the species that rely on them, such as freshwater mussel, many of which are critically imperiled. Studies and analysis indicate that threatened and endangered species that rely on the waterways impacted by surface coal mining, such as fish and freshwater mussels, are most susceptible when they are within ten river miles of mining projects.²⁵⁶ The sediments and

²⁵⁶ Anderson, R. M., Layzer, J. B., & Gordon, M. E. (1991). Recent catastrophic decline of mussels (Bivalvia, Unionidae) in the Little South Fork Cumberland River, Kentucky. *Brimleyana*, (17), 1-8.; Layzer, J. B., & Anderson, R. M. (1992). Impacts of the coal industry on rare and endangered aquatic organisms of the upper Cumberland River Basin. Kentucky Department of Fish and Wildlife Resources; Warren Jr, M. L., & Haag, W. R. (2005). Spatio-temporal patterns of the decline of freshwater mussels in the Little South Fork Cumberland River, USA. *Biodiversity & Conservation*, 14(6), 1383-1400; Houpp, R. E. (1993). Observations of long-term effects of sedimentation on freshwater mussels (Mollusca: Unionidae) in the North Fork of Red River, Kentucky. *Transactions of the Kentucky Academy of Science*, 54(3-4), 93-97; U.S. Environmental Protection Agency. (2002). Clinch and Powell Valley Watershed Ecological Risk Assessment. EPA/600/R-01/050; Newton, T. J., & Bartsch, M. R. (2007). Lethal and sublethal effects of ammonia to juvenile *Lampsilis* mussels (unionidae) in sediment and water-only exposures. *Environmental Toxicology and Chemistry*, 26(10), 2057-2065; Vannote, R. L., & Minshall, G. W. (1982). Fluvial processes and local lithology controlling abundance, structure, and composition of mussel beds. *Proceedings of the National Academy of Sciences*, 79(13), 4103-4107; Pond, G. J., Passmore, M. E., Borsuk, F. A., Reynolds, L., & Rose, C. J. (2008). Downstream effects of mountaintop coal mining: comparing biological conditions using family-and genus-level macroinvertebrate bioassessment tools. *Journal of the North American Benthological Society*, 27(3), 717-737; Jenkinson, J. J. (2005). Specific gravity and freshwater mussels. *Ellipsaria*, 7, 12-13; McCann, M.T. & Neves, R.J.(1992). Toxicity of coal-related contaminants to early life stages of freshwater mussels in the Powell River, Virginia. Virginia Cooperative Fish and Wildlife Research Unit, Dept. of Fisheries and Wildlife Sciences. Research Work Order No. 23 for U.S. Fish and Wildlife Service, Asheville Field Office. August 1992; Kitchel, H. E., Widlak, J. C., & Neves, R. J. (1981). The impact of coal-mining waste on endangered mussel populations in the Powell River, Lee County, Virginia. Report to the Virginia State Water Control Board, Richmond; Ahlstedt, S. A., & Tuberville, J. D. (1997). Quantitative reassessment of the freshwater mussel fauna in the Clinch and Powell Rivers, Tennessee and Virginia. Conservation and management of freshwater mussels II. Upper Mississippi River Conservation Committee, Rock Island, Illinois, 72-97; Burkhead, N. M., & Jelks, H. L. (2001). Effects of suspended sediment on the reproductive success of the tricolor shiner, a crevice-spawning minnow. *Transactions of the American Fisheries Society*, 130(5), 959-968; Sutherland, A. B., & Meyer, J. L. (2007). Effects of increased suspended sediment on growth rate and gill condition of two southern Appalachian minnows. *Environmental Biology of Fishes*, 80(4), 389-403; Jones, E. B., Helfman, G. S., Harper, J. O., & Bolstad, P. V. (1999). Effects of riparian forest removal on fish assemblages in southern Appalachian streams. *Conservation biology*, 13(6), 1454-1465; Sutherland, A. B., Maki, J., & Vaughan, V. (2008). Effects of suspended sediment on whole-body cortisol stress response of two southern Appalachian minnows, *Erimonax monachus* and *Cyprinella galactura*. *Copeia*, 2008(1), 234-244; Zamor, R. M., & Grossman, G. D. (2007). Turbidity affects foraging success

pollutants that harm these species are most prevalent within this ten mile area; therefore, we urge BLM to protect our rivers and streams, and to fulfill its ESA obligations, by ensuring that mining activities do not result in the introduction of sediment or other pollutants, such that no harm will occur to species within at least ten river miles of a mining project. We also emphasize that only considering pollution impacts ten river miles downstream may not adequately address comprehensive downstream water quality impacts such as cumulative sedimentation or biomagnification of contaminants. For this reason, we ask BLM to consult with the Services on this issue (see below).

We do note that Criterion 15 has the potential to provide a means for the protection of these essential habitat areas, and therefore it would seem that BLM understands – at least in theory – the prudence of habitat protection; however, the issue seems to be one of enforcement and accountability, and it is readily apparent that many such areas are not being protected from coal mining. As discussed above, even with these unsuitability criteria in place, data published since 1996 document increasingly significant declines in numerous imperiled and federally protected taxa, and degradation of their habitats, as the result of surface coal mining. Recent scientific and policy documents further show that surface mining is increasingly imperiling numerous species of many taxa.²⁵⁷ Clearly, more must be done to protect essential habitats and the species that rely on them from coal mining.

2. Impacts from mining and combusting coal are not being adequately mitigated

The Notice of Intent To Prepare a Programmatic Environmental Impact Statement seeks comment on “BLM’s general approach to mitigation for these impacts from coal production, and specifically, whether impacts from mining and combusting Federal coal are adequately mitigated across the Federal coal program.” It is readily apparent that mitigation for the impacts of coal mining has been woefully inadequate. As discussed herein, the existing regulatory program has proven to be insufficient, resulting in the wanton destruction of habitat areas across the country. For example, the Powder River Basin in Montana and Wyoming is well known as a sacrifice zone that pumps out coal for domestic and foreign use. Once home to wide ranging elk herds, pronghorn, mule deer, prairie falcons, bobcats, mountains lions, and greater sage-grouse – as well as providing habitat for hundreds of migratory birds – today the region is largely dotted with coal mines, roads, and other coal-related facilities. While wildlife still hang on the brink of extirpation in a few areas in this region, the basin evidences how environmental laws have failed to strike a balance of protecting environmental values while authorizing coal production, and that harm is not being mitigated.

Although the majority of federal coal leasing occurs in the interior west (and primarily the Powder River Basin of Wyoming and Montana), federal coal leasing also occurs in Appalachia, where biodiversity and human health are being devastated for coal production.²⁵⁸

of drift-feeding rosieside dace. *Transactions of the American Fisheries Society*, 136(1), 167-176; Newcombe, C. P., & Jensen, J. O. (1996). Channel suspended sediment and fisheries: a synthesis for quantitative assessment of risk and impact. *North American Journal of Fisheries Management*, 16(4), 693-727; Newcombe, C. P., & MacDonald, D. D. (1991). Effects of suspended sediments on aquatic ecosystems. *North American Journal of Fisheries Management*, 11(1), 72-82.

²⁵⁷ See Notes 13 and 14.

²⁵⁸ See, e.g., BLM and USFS, Environmental Assessment, Bledsoe Coal Lease, KYES-53865 (Oct. 2012), available at

http://www.blm.gov/style/medialib/blm/es/minerals/coal/coal_lease_sales_nepa.Par.46357.File.dat/BledsoeCoalLea

Home to the greatest freshwater biological diversity in the U.S., Appalachia is a true species hot spot. Yet, coal mining is contributing to the alarming loss of biological diversity in the Appalachian Mountains. This has been evidenced by the vast upswing in aquatic dependent species requiring ESA protection in the southeast region. The USFWS's findings in protecting such species illustrate that coal mining is a significant threat leading to species listings. Further, already listed species in the region are also experiencing ongoing declines due to downstream impacts from surface mining, such as sedimentation, and existing regulations are utterly failing to protect species from these impacts.

For example, in listing the Cumberland darter as endangered, the USFWS found that sediment/siltation is “the most common stressor of aquatic communities in the upper Cumberland River basin” and the “primary source of sediment” is “resource extraction” – i.e., coal mining and logging.²⁵⁹ The USFWS identified “water quality degradation” and the addition of “high concentrations of dissolved metals and other solids that lower stream pH or lead to elevated levels of stream conductivity” as another “significant threat” to the Cumberland darter.²⁶⁰ Likewise, in listing the blackside dace, the USFWS recognized “that impacts associated with the development of [coal and timber] resources in the past has caused the loss of many blackside dace populations.”²⁶¹

Coal mining was also identified as a threat to, and among the reasons for listing, rayed bean and snuffbox mussels. The USFWS found that “low pH commonly associated with coal mine runoff can reduce glochidial encystment rates, thus impacting mussel recruitment” and that

adverse impacts from heavy-metal-rich drainage from coal mining and associated sedimentation have been documented in portions of historical rayed bean and snuffbox habitat in the upper Ohio River system in western Pennsylvania, West Virginia, and southeastern Ohio. Likewise, coal mining has impacted rayed bean habitat in the upper Tennessee River system, Virginia, and snuffbox habitat in eastern Kentucky (lower Ohio and Mississippi River systems in southeastern Illinois and western Kentucky; upper Cumberland River system in southeastern Kentucky and northeastern Tennessee; and upper Tennessee River system in southwestern Virginia).²⁶²

Similar conclusions were reached in listing the sheepsnose and spectaclecase mussels.²⁶³ Water quality degradation from surface coal mining also contributed to the need to list the

[se.EA.12Oct2012.LowResolu.pdf](#); see generally BLM, BLM Eastern States Coal Sales, <http://www.blm.gov/es/st/en/prog/minerals/coal.html>.

²⁵⁹ Endangered status for the Cumberland Darter, Rush Darter, Yellowcheek Darter, Chucky Madtom, and Laurel Dace, Final Rule. 76 Fed. Reg. 48,722, 48,732 (2011). Although federal coal holdings are not as pervasive as in the Powder River Basin, federal coal leases affect Cumberland Basin waters and species. See BLM and USFS, Environmental Assessment, Bledsoe Coal Lease.

²⁶⁰ 76 Fed. Reg. at 48,732.

²⁶¹ Determination of threatened species status for the blackside dace, Final Rule. 52 Fed. Reg. 22,580 (1987).

²⁶² Determination of endangered status for the rayed bean and snuffbox mussels throughout their ranges. 77 Fed. Reg. 08632 (2012) (internal citations omitted).

²⁶³ Determination of endangered status for the Sheepsnose and Spectaclecase mussels throughout their range, final rule. 77 Fed. Reg. 14914 (2012). In addition, the FWS designated 27 miles of the main stem of the Big South Fork and 9 miles of the New River in Tennessee as critical habitat for three endangered mussels: Cumberland elktoe, oyster mussel, and Cumberlandian combshell. 60 Fed. Reg. at 53,148.

diamond darter in West Virginia,²⁶⁴ the addition of the Kentucky arrow darter to the candidate list,²⁶⁵ and the proposed listing for the Big Sandy and Guyandotte River crayfishes.²⁶⁶

The biological impacts of coal mining are not limited to the Powder River Basin. These impacts are felt in coal mining areas throughout our country. For example, recent coal leasing proposals in Utah also highlight the on-going failure to address impacts to species, including greater sage-grouse and Utah prairie dog, that are vulnerable to habitat loss.²⁶⁷ Thus, coal mining activities are impacting species that have been recognized as vulnerable to such activities across the country, and efforts to mitigate these impacts have not been successful.

This is due to the basic fact that effectively mitigating the impacts of coal mining is fundamentally not possible. Surface coal mining is accomplished by logging or clearing the mine site, then removing overburden from the coal seam and then blasting and removing the coal. This includes strip mining and open pit mining practices, as well as mountain top removal mining, wherein excess mining waste is dumped into fills in nearby hollows or valleys, smothering streams and habitat. Surface coal mining requires large areas of land to be disturbed,

²⁶⁴ U.S. Fish and Wildlife Service (FWS). (2013). Endangered species status for diamond darter, final rule. 78 FR 45079 (“While the overall percentage of the entire Elk River watershed subjected to mining activities may be small, watersheds of some Elk River tributaries, such as Leatherwood Creek, are highly dominated by mining activity and include mining permits encompassing 81 to 100 percent of the subwatersheds (WVDEP 2011b, p. 37). Mining is likely a significant factor affecting the water quality of streams, such as Leatherwood Creek, that are principle tributaries to the Elk River. The effects of these mining activities conducted both within the Elk River mainstem and in Elk River tributaries, coupled with the effects from other activities described in Factor A, are continuing threats to the diamond darter.”).

²⁶⁵ U.S. Fish and Wildlife Service FWS. (2010). Candidate Notice of Review. 75 Fed. Reg. 69,224 (“The subspecies’ habitat and range have been severely degraded and limited by water pollution from surface coal mining and gas-exploration activities; removal of riparian vegetation; stream channelization; increased siltation associated with poor mining, logging, and agricultural practices; and deforestation of watersheds. The threats are high in magnitude because they are widespread across the subspecies’ range. In addition, the magnitude (severity or intensity) of these threats, especially impacts from mining and gas- exploration activities, is high because these activities have the potential to alter stream water quality permanently throughout the range by contributing sediment, dissolved metals, and other solids to streams supporting Kentucky arrow darters, resulting in direct mortality or reduced reproductive capacity. The threats are imminent because the effects are manifested immediately and will continue for the foreseeable future.”).

²⁶⁶ U.S. Fish and Wildlife Service. (2015). Endangered species status for the Big Sandy and Guyandotte River Crayfishes, proposed rule. 80 Fed. Reg. 18,726 (“Coal mining—The past and ongoing effects of coal mining in the Appalachian Basin are well documented, and both underground and surface mines are reported to degrade water quality and stream habitats. Notable water quality changes associated with coal mining in this region include increased concentrations of sulfate, calcium, and other ions (measured collectively by a water’s electrical conductivity); increased concentrations of iron, magnesium, manganese, and other metals; and increased alkalinity and pH, depending on the local geology. The common physical changes to local waterways associated with coal mining include increased erosion and sedimentation, changes in flow, and in many cases the complete burial of headwater streams. These mining-related effects are commonly noted in the streams and rivers within the ranges of the Big Sandy and the Guyandotte River crayfishes. The response of aquatic species to coal mining-induced degradation are also well documented, commonly observed as a shift in a stream’s macroinvertebrate (e.g., insect larva or nymphs, aquatic worms, snails, clams, crayfish) or fish community structure and resultant loss of sensitive taxa and an increase in tolerant taxa. As mentioned above, coal mining can cause a variety of changes to water chemistry and physical habitat; therefore, it is often difficult to attribute the observed effects to a single factor. It is likely that the observed shifts in community structure (including the extirpation of some species) are, in many cases, a result of a combination of factors.” (internal references omitted)).

²⁶⁷ BLM, Alton Coal Lease Tract Lease By Application, Supplemental Draft Environmental Impact Statement, DOI-BLM-UT-C040-2015-011-EIS (June 2015).

destroying mountains and forest habitat, and results in deposition of sediment and heavy metals into waterbodies, which results in adverse impacts on streams and local biodiversity.²⁶⁸ It is the height of human arrogance to suggest that these impacts can be sufficiently mitigated. Rather, it is clear that the lost functions and values of the areas decimated by coal mining are near impossible to recover.

To date, restoration and mitigation efforts have largely failed when it comes to protecting water quality and species. For this reason, we ask BLM to focus on protection of essential habitat areas and waterways first, and to rely on mitigation only in certain limited situations – i.e., when ESA-listed or proposed species or designated critical habitats are not present downstream or in the mine site area, and it can be shown with sufficient evidence that the functions and values of the impacted streams and native ecosystems can be fully restored.

Numerous studies document the failure of restoration to protect water quality, species, and local communities from the impacts of coal mining. These studies are too numerous for us to list in total so we provide relevant excerpts of scientific conclusions:

- “Overall, the data show that mitigation efforts being implemented in southern Appalachia for coal mining are not meeting the objectives of the Clean Water Act to replace lost or degraded streams ecosystems and their functions”²⁶⁹
- “Mitigation actions being undertaken are primarily geomorphic projects to enhance perennial streams yet the majority of streams impacted are intermittent and fewer linear feet of stream have been restored than impacted. Compliance is primarily based on visual habitat assessments performed by the mining company or their consultants which typically report marginal or suboptimal habitat status post restoration. Projects were not required to meet specified biological or water quality standards yet for the projects that reported such data, most were impaired.”²⁷⁰
- “The disturbance caused by MTR/VF is drastically changing the central Appalachian landscape, compromising the natural ecological and functional state of both terrestrial and aquatic environments. The reclamation process, emphasizing soil compaction and the establishment of non-native herbaceous species, has hindered the establishment of native tree species on MTR sites (Zipper et al., 2011). These terrestrial impacts in combination with changes in water chemistry and stream geomorphology lead to long-lasting changes

²⁶⁸ See e.g. U.S. DEPARTMENT OF THE INTERIOR, DRAFT STREAM PROTECTION RULE ENVIRONMENTAL IMPACT STATEMENT 4-95 (2015) (stating that the removal of trees and habitat fragmentation associated with coal mining “may cause species to become threatened or endangered, and can contribute to species extinction”); *Id.* at 4-113 (“The negative effects of mining on specific features of habitats (soils, topography, water quality, and vegetation) may make it more difficult for wildlife species to reestablish after a mining disturbance and may increase the proliferation of non-native species on reclaimed landscapes.”); *Nat’l Parks Conservation Ass’n v. Jewell*, 62 F. Supp. 3d 7, 16 (D.D.C. 2014) (noting that “[d]irect effects of surface coal mining and reclamation operations on threatened, endangered, or proposed species or critical habitat consists [sic] primarily of habitat alteration by land clearing and earthmoving operations.... If a species of concern lacks individual mobility, land clearing and excavation activities may result in a direct take”).

²⁶⁹ Palmer, M. A., & Hondula, K. L. (2014). Restoration as mitigation: analysis of stream mitigation for coal mining impacts in southern Appalachia. *Environmental science & technology*, 48(18), 10552-10560.

²⁷⁰ *Id.*

to terrestrial and aquatic ecosystem function (Simmons et al., 2008). Full recovery of species diversity in streams impacted by MTR/VF has not been documented”²⁷¹

- “Indeed, the MTR/VF streams had, on average, 75% less forest cover than control streams”²⁷²
- “Reclaimed mine sites have soils containing unweathered rock that is heavily compacted to reduce erosion, resulting in altered water tables and disturbed flow paths (Bonta et al., 1992; Bernhardt and Palmer, 2011). In particular, compacted soils lead to high rates of storm water runoff. Negley and Eshleman (2006) and Ferrari et al. (2009) found that MTR/VF streams had tripled storm runoff and doubled flow rates compared to reference catchments.”
- “The extent to which these constructed channels provide important ecosystem services lost by burial of natural headwater streams as a result of mining is not well known. Fritz et al. (2010) reported significantly lower rates of litter breakdown and higher levels of iron, manganese, sulfate, and conductivity in constructed channels draining VF watersheds than in natural channels draining forested watersheds. Petty et al. (2013) observed lower organic matter (OM) decomposition rates and higher levels of conductivity, dissolved solids, and dissolved organic carbon (DOC) in West Virginia MTR/ VF constructed channels than in nearby reference channels. Based on their database containing descriptions of 38,000 stream and river restoration projects, Bernhardt and Palmer (2011) stated that they did not know of a single case where a constructed channel recreated the hydrology or ecological functions of natural streams.”²⁷³

As these examples illustrate, mitigation of coal mining activities has failed to reclaim the functions and values of impacted waterways. In particular, it has failed in Appalachia to restore water quality and fish, wildlife, and other species. Moreover, as discussed above coal mining has been one of several threats that has led to the need to protect species under the ESA, indicating that mitigation efforts have not been successful in protecting species, and should not be relied on by BLM to protect the environment.

Therefore, in light of the record before it, it is critical that BLM ensure that waterways affected by proposed mines with ramifications for species listed or proposed for listing under the ESA and their critical habitat are protected, rather than rely on mitigation plans to justify destruction of these important habitat areas, since restoration plans may not adequately address impacts to imperiled species and their habitat.²⁷⁴

²⁷¹ Brenee’L, M., Price, S. J., Bonner, S. J., & Barton, C. D. (2014). Mountaintop removal mining reduces stream salamander occupancy and richness in southeastern Kentucky (USA). *Biological Conservation*, 180, 115-121.

²⁷² *Id.*

²⁷³ Burke, R. A., Fritz, K. M., Barton, C. D., Johnson, B. R., Fulton, S., Hardy, D., ... & Jack, J. D. (2014). Impacts of mountaintop removal and valley fill coal mining on C and N processing in terrestrial soils and headwater streams. *Water, Air, & Soil Pollution*, 225(8), 1-17.

²⁷⁴ According to the DOI Energy and Climate Change Task Force, avoidance should be the first goal: “If a project can reasonably be sited so as to have no negative impacts to resources of concern then that is generally the most defensible approach. By avoiding adverse impacts in the first place, there is no need to take further action to

If BLM will continue to rely on mitigation for the coal program, a new mitigation protocol must be developed. The Department of the Interior has been revising its mitigation policies in recent years, and has in fact declared that it is “necessary to successfully shift from project-by-project management to consistent, landscape-scale, science-based management of the lands and resources for which the Department is responsible.”²⁷⁵ DOI has further stated that “[i]n the mitigation context, the landscape approach dictates that it is not sufficient to look narrowly at impacts at the scale of the project; it is necessary to account for impacts to resource values throughout the relevant range of the resource that is being impacted.”²⁷⁶

It does not appear that the current mitigation regime for BLMs coal program is meeting the goals set forth by DOI. Mitigation is done piecemeal, without the comprehensive, industry-wide analysis that is necessary for landscape-scale mitigation, resulting in the environmental harm discussed herein. As DOI even admits, “mitigation experts have noted, ‘[T]he way mitigation is currently applied does not capture cumulative impacts associated with development; it does not provide a structured decision-making framework to determine when projects can proceed or should be avoided; and it does not harness the full potential of offsets (conservation actions applied away from the development site).’”²⁷⁷

To rectify this, DOI has provided guiding principles for landscape-scale mitigation. These include that an agency, “[a]t the outset of the project planning process, [should] incorporate mitigation and landscape objectives into the design and development of projects that are likely to impact natural or cultural resources.” DOI further urges bureaus to “[i]dentify and promote mitigation efforts that improve the resilience of our nation’s resources in a rapidly changing climate,” and to “[p]romote transparency and consistency in the development of mitigation measures.” Therefore, we urge BLM to undertake, concurrent with this programmatic EIS, an analysis of the various alternatives to mitigation for coal mining, and to thereby develop protocols to establish a mitigation program on a landscape-scale.²⁷⁸ This should be done in consultation with FWS and NMFS for mitigation that has the potential to affect listed species.²⁷⁹

B. BLM Must Undertake ESA Consultation on the Coal Program

minimize or offset such impact.” See A Strategy for Improving the Mitigation Policies and Practices of The Department of the Interior at 2 (April, 2014).

²⁷⁵ The Energy and Climate Change Task Force, A Strategy for Improving the Mitigation Policies and Practices of The Department of the Interior at I (April, 2014).

²⁷⁶ *Id.* at II.

²⁷⁷ *Id.* at 8 (citing Kiesecker, Joseph M., Holly E. Copeland, Bruce A. McKenney, Amy Pocewicz, and Kevin E. Doherty. 2011. Energy by Design: Making Mitigation Work for Conservation and Development. Chapter 9 in: David E. Naugle (Ed.), Energy Development and Wildlife Conservation in Western North America. pp. 159-181).

²⁷⁸ *Id.* at 13. DOI has provided a process to follow for this analysis, which includes four steps:

1) identifying key landscape-scale attributes, and the conditions, trends, and baselines that characterize these attributes; 2) developing landscape-scale goals and strategies; 3) developing efficient and effective compensatory mitigation programs for impacts that cannot be avoided or minimized; and 4) monitoring and evaluating progress and making adjustments, as necessary, to ensure that mitigation is effective despite changing conditions.

²⁷⁹ See *id.* at 12 (directing bureaus to “Coordinate with other federal and state agencies, tribes, and stakeholders in conducting assessments of existing and projected resource conditions, forming mitigation strategies, and developing compensatory mitigation programs.”).

Congress enacted the ESA in 1973 to provide for the conservation of endangered and threatened fish, wildlife, plants and their natural habitats.²⁸⁰ The ESA imposes substantive and procedural obligations on all federal agencies with regard to listed and proposed species and their critical habitats.²⁸¹

Under section 7 of the ESA, federal agencies must “insure that any action authorized, funded, or carried out by such agency ... is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined ... to be critical.”²⁸²

The definition of agency “action” is broad and includes “all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies,” including programmatic actions, such as the BLM action at issue here.²⁸³

The duties in ESA section 7 are only fulfilled by an agency’s satisfaction of the consultation requirements that are set forth in the implementing regulations for section 7 of the ESA, and only after the agency lawfully complies with these requirements may an action that “may affect” a protected species go forward.²⁸⁴ Here, BLM is considering broad changes to the Federal coal program, which “includes land use planning, processing applications (*e.g.*, for exploration licenses and lease sales), estimating the value of proposed leases, holding lease sales, and post-leasing actions...”²⁸⁵ According to BLM’s Notice, “[t]he Federal coal program has other potential impacts on public health and the environment, beyond climate impacts, that will also be assessed in the Programmatic EIS. These include the effects of coal production on . . . wildlife, including endangered species. . . .”²⁸⁶ Based on this admission, it is clear that BLM must undertake programmatic consultation in order to fulfill its duties pursuant to Section 7 of the ESA.

However, while formal programmatic consultation is required on BLM’s coal program, it would be improper and unlawful for any incidental take statement to be issued as part of the biological opinion.²⁸⁷ Numerous different ESA-protected species and their designated critical habitats are likely to be adversely affected. It remains unclear whether sufficient protections will be implemented to ensure that listed species are not jeopardized by cumulative impacts

²⁸⁰ *Id.* §§ 1531, 1532.

²⁸¹ *See id.* §§ 1536(a)(1), (a)(2) and (a)(4) and § 1538(a); 50 C.F.R. § 402.

²⁸² 16 U.S.C. § 1536(a)(2).

²⁸³ 50 C.F.R. § 402.02. Likewise, the “action area” includes “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.” *Id.*

²⁸⁴ *Pac. Rivers Council v. Thomas*, 30 F.3d 1050, 1055-57 (9th Cir. 1994).

²⁸⁵ 81 Fed. Reg. at 17722.

²⁸⁶ *Id.* at 17726.

²⁸⁷ It is well-settled that programmatic biological opinions do not require an incidental take statement where those opinions explicitly mandate future site-specific consultations for take authorizations. *See Gifford Pinchot Task Force v. USFWS*, 378 F.3d 1059, 1067–68 (9th Cir.) *am. by* 387 F.3d 968 (9th Cir. 2004); *Forest Serv. Employees for Env’tl. Ethics*, 726 F. Supp. 2d at 1224–1225; *W. Watersheds Project v. BLM*, 552 F. Supp. 2d 1113, 1139 (D. Nev. 2008); *Swan View Coal, Inc. v. Turner*, 824 F. Supp. 923, 934–35 (D. Mont. 1992). Here, should the Services issue a no-jeopardy opinion on OSMRE’s regulations, it should not be accompanied by an incidental take statement because all incidental take (including any resulting from OSMRE-issued SMCRA permits) should only be authorized, if at all, via a Section 10 permit or Section 7 consultation.

Moreover, there is no feasible way that the Services can predict, let alone quantify, the amount of incidental take of currently-listed species that will result from coal mining throughout the country under BLM's program in the years to come. Further, the biological opinion cannot possibly analyze or quantify incidental take for future-listed species that will be adversely affected by coal mining. Rather, incidental take can only occur, and can only be analyzed an appropriately permitted, at the site-specific and species-specific level. Therefore, consistent with the Services' revised regulations defining "framework programmatic action," the programmatic consultation on BLM's revised coal program should acknowledge that it is a framework programmatic consultation under which any incidental take will be subsequently authorized under a permit-specific Section 7 or Section 10 process.²⁸⁸

1. BLM must consult at the Programmatic EIS stage

It is well-established that programmatic decisions are subject to the ESA's consultation requirement.²⁸⁹ A programmatic decision to continue or modify the federal coal leasing program is an "agency action" for purposes of the ESA. The ESA defines agency action as "any action authorized, funded, or carried out" by a federal agency. 16 U.S.C. § 1536(a)(2). The phrase is further defined in ESA regulations as "all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies." 50 C.F.R. § 402.02. These include: "(b) the promulgation of regulations" and "(d) actions directly or indirectly causing modifications to the land, water or air." *Id.*

Moreover, any to defer analysis of the potential impacts to listed species to a later decision would violate BLM's regulations regarding special status species as set forth in BLM Manual 6840 - Special Status Species Management. Pursuant to Manual 6840, it is the responsibility of State Directors to not only inventory BLM lands to determine the occurrence of BLM special status species, but also to determine "the condition of the populations and their habitats, and how discretionary BLM actions affect those species and their habitats."²⁹⁰ The leasing of federal lands for coal extraction is a discretionary BLM action that has the potential to adversely affect listed species. Deferring an analysis of the potential effects of selling coal leases to the ___ stage is entirely inconsistent with the requirements of Manual 6840. If a lease is sold, the lessee acquires certain contractual rights constraining BLM authority. For example, according to 43 C.F.R. § 3101.1-2, once a lease is issued to its owner, that owner has the "right to use as much of the lease lands as is necessary to explore for, drill for, mine, extract, remove and dispose of the leased resource in the leasehold" subject to specific nondiscretionary statutes and lease stipulations. Therefore, once the lease is sold, it will be too late for BLM to ensure that sufficient protections will be in place to protect this species from the cumulative impacts of extraction-related activities.

²⁸⁸ See 80 Fed. Reg. 26,832 (May 11, 2015) (adding definition of "framework programmatic action" to 50 C.F.R. § 402.02 and adding 50 C.F.R. § 402.14(i)(1)(6) on incidental take statements not being required at the programmatic level where subsequent actions resulting in incidental take will be separately consulted on).

²⁸⁹ See, e.g., *New Mexico v. Bureau of Land Management*, 565 F.3d 683, 689, n.1 (10th Cir. 2009) *Conner v. Burford*, 848 F.2d 1441 (9th Cir. 1988); *Lane County Audubon Society v. Jamison*, 958 F.2d 290 (9th Cir. 1988); *Pacific Rivers Council v. Thomas*, 30 F.3d 1050 (9th Cir. 1994); *Silver v. Babbitt*, 924 F.Supp. 976 (D. Ariz. 1995)

²⁹⁰ *Id.* at § .04.

The development of species-specific and ecosystem-based conservation strategies implicitly necessitates a more holistic review of the cumulative impacts of the proposed lease sale, which cannot be accomplished through site-specific analysis alone. And, piecemeal analyses of individual lease sales do not provide the appropriate perspective for examining the cumulative effects of hydraulic fracturing and climate change impacts at the regional and landscape scale and for making land management decisions.

Where activities have the potential to adversely impact listed species, those impacts must be addressed “at the earliest possible time,” in order to avoid delay, ensure that impacts are avoided and opportunities for mitigation are not overlooked.²⁹¹ Furthermore, under the ESA an analysis of the effects of an action must consider actions that are interrelated or interdependent.²⁹² This suggests that BLM should consider the effects of coal mining, transport, combustion and disposal activities at the lease sale stage, since those actions are inherent in leasing land for such purposes. It is therefore evident that in order to effectuate the policy of protecting Bureau sensitive species set forth in Manual 6840,²⁹³ and consistent with the established practice of early, comprehensive review of potential impacts to sensitive species, BLM must consider impacts to listed species at the lease sale, rather than waiting until the APD stage for project specific review.

2. BLM Must Consult Regarding the Mercury Impacts of the Coal Program’s Foreseeable Coal Combustion

The indirect effects of coal leasing and mining include atmospheric emissions of mercury from coal combustion. Mercury is a potent and widely distributed neurotoxin with serious adverse health effects on human health and development as well as the behavior, reproduction, and survival of threatened and endangered species. The United Nations estimates that 26% of global mercury emissions (339-657 metric tons/ year) come from the combustion of coal in power plants.²⁹⁴ A recent decision held that agencies must consider the indirect effects of even microscopic levels of mercury from coal leasing, mining and combustion decisions:

the record reveals that even microscopic changes in the amount of mercury deposition can have significant impacts on threatened and endangered species in the area impacted by the Four Corners Power Plant. See AR 1-2-14-1990 (concluding that a .1% increase in mercury deposition in the basin is likely to jeopardize the continued existence of the Colorado pikeminnow). Given the potentially significant impacts of mercury pollution, OSM’s failure to discuss or analyze the deleterious impacts of combustion-related mercury deposition in the area of the Four Corners Power Plant is troubling.²⁹⁵

²⁹¹ See *i.e.* 50 C.F.R. §§ 402.14(a), (g)(8).

²⁹² 50 C.F.R. §§ 402.14 and 402.02.

²⁹³ See BLM Manual 6840 at .06 (“Bureau sensitive species will be managed consistent with species and habitat management objectives in land use and implementation plans to promote their conservation and to minimize the likelihood and need for listing under the ESA.”).

²⁹⁴ J. Pacyna, et al., *Study on Mercury Sources and Emissions and Analysis of Cost and Effectiveness of Control Measures: “UNEP Paragraph 29 Study”*, UNEP (Nov. 2010).

²⁹⁵ *Dine Citizens Against Ruining Our Environment v. U.S. Office of Surface Mining Reclamation and Enforcement*, 82 F.Supp. 3d 1201, 1215 (D. Colo. 2015).

The deposition of mercury and selenium within the Colorado River Basin continues to threaten both human health and endangered species, including the four Colorado River endangered fish. Current scientific information indicates continuing mercury and selenium contamination in the Colorado River Basin, which has the potential to detrimentally affect these species.

Consumption through the food chain is the primary mechanism of bioaccumulation of mercury in the endangered fish, and particularly affects the Colorado pikeminnow's diet as the largest of the endangered Colorado River fish (Herrmann et al. 2016 at 204). Sources of mercury include high levels of atmospheric mercury deposition called "cold condensation" from coal-fired power plant emissions (*Id.* at 205). This atmospheric deposition and watershed runoff is the most prevalent source of mercury in the Colorado River, but mercury pollution from old gold smelters in the Basin have also infiltrated this river system through decades of runoff from smaller tributaries (*Id.* at 215). In Grand Canyon, there is a high concentration of mercury in the atmosphere due to emissions from the coal burning Navajo Generating Station in Page, Arizona, resulting in direct negative effects on the endangered fishes' habitat in the lower Colorado River Basin (Walters 2015 at 2385).

Mercury contamination is especially concerning because all four species depend on aquatic invertebrates as a food source. Other piscivorous animals and non-native fish that prey on these juvenile fish, in turn, accumulate mercury, which continues up the food chain, bioaccumulating in adult fish. Concentrations of mercury exceeding 8 micrograms ($\mu\text{g/g}$) in fish organs or eggs may result in reproductive dysfunction and abnormalities (Herrmann et al. 2016 at 204). Walters et al. (2015) found that mean mercury concentrations for three native species and three non-native species from a Colorado River sample site exceeded the risk threshold for piscivorous mammal consumption (*Id.* at 2390).

Because of the scale of the federal coal leasing program (over 40% of U.S. coal production), BLM must quantify, consider, and consult on, the indirect mercury emissions from combustion of coal, its contribution to global mercury atmospheric concentrations and deposition rates, and its ensuing effects on sensitive, threatened, and endangered species, including the four Colorado River listed fish.

3. BLM Must Consult Regarding the Climate Impacts of the Coal Program's Foreseeable GHG Emissions

In reviewing the federal coal leasing program, the Bureau of Land Management must consider the impacts, including climate impacts, on threatened and endangered species. Specifically, the Bureau must consult with the Fish and Wildlife Service and National Marine Fisheries Service as required by section 7 of the Endangered Species Act.

The ESA was enacted, in part, to provide a “means whereby the ecosystems upon which endangered species and threatened species depend may be conserved...[and] a program for the conservation of such endangered species and threatened species.”²⁹⁶ Section 2(c) of the ESA establishes that it is “the policy of Congress that all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act.”²⁹⁷ The ESA defines “conservation” to mean “the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary.”²⁹⁸ Similarly, Section 7(a)(1) of the ESA directs that the Bureau and other federal agencies shall use their programs and authorities²⁹⁹ to conserve endangered and threatened species.²⁹⁹

To fulfill the purposes of the ESA, federal agencies are required to “insure that any action authorized, funded, or carried out by such agency...is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the adverse modification of habitat of such species... determined...to be critical.”³⁰⁰ When an agency action “may affect listed species or critical habitat” the agency must consult with expert wildlife agencies, Fish and Wildlife Service and National Marine Fisheries Service, using the “best scientific and commercial data available.”³⁰¹ ESA consultation serves as an essential function to guide federal actions and identify mitigation to avoid harming listed species. Through consultation, the Services may specify reasonable and prudent alternatives that will avoid jeopardizing listed species and “suggest modifications” to the action to “avoid the likelihood of adverse effects” to the listed species.³⁰²

Here, the Bureau must consult on the federal coal leasing program to ensure that coal leasing does not further imperil endangered species. Agencies are required to consult on programs that manage federal lands and leasing, including this coal leasing program.³⁰³ The ESA expressly and broadly requires an agency to comply with Section 7 for “any action” it authorizes or funds.³⁰⁴ “Action” is broadly defined to include “all activities or *programs* of any kind authorized, funded, or carried out, in whole or in part” by federal agencies and includes actions that may directly or indirectly cause modifications to the land, water, or air.”³⁰⁵

²⁹⁶ 16 U.S.C. § 1531(b).

²⁹⁷ 16 U.S.C. § 1531(c)(1).

²⁹⁸ 16 U.S.C. § 1532(3).

²⁹⁹ 16 U.S.C. § 1536(a)(1).

³⁰⁰ 16 U.S.C. § 1536(a)(2) (Section 7 consultation).

³⁰¹ 50 C.F.R. § 402.14(a).

³⁰² 16 U.S.C. § 1536(b); 50 C.F.R. § 402.13.

³⁰³ See e.g., *Cal. ex rel. Lockyer v. United States Dep't of Agric.*, 459 F. Supp. 2d 874, 912 (N.D. Cal. 2006) (finding that the Forest Service violated the ESA by failing to consult on the effects of the State Petitions Rule (which replaced the Roadless Rule) and noting that “[t]he fact that consultation would only address impacts at the programmatic level does not excuse the need to do so); *aff'd sub nom Cal. ex rel. Lockyer v. USDA*, 575 F.3d 999 (9th Cir. 2009); see also *Conner v. Bufford*, 848 F.2d 1441, 1453-54 (9th Cir. 2012).

³⁰⁴ 16 U.S.C. § 1536(a)(2) (emphasis added); *Pac. Rivers Council v. Thomas*, 30 F.3d 1050, 1054 (9th Cir. 1994) (“there is little doubt that Congress intended to enact a broad definition of agency action in the ESA”).

³⁰⁵ 50 C.F.R. § 402.02 (emphasis added).

The coal leasing program may affect numerous threatened and endangered species, and it is essential that such consultation evaluate the effects of the coal leasing program's significant contribution to greenhouse gas emissions and the resulting harm to listed species and their habitats from climate change.

As greenhouse gas emissions and the resulting harms from climate change grow, the Fish and Wildlife Service and National Marine Fisheries Service are increasingly recognizing climate change as a significant threat to listed species. The Services determined that climate change is a threat (and a listing factor) in the listing rules for the vast majority of species listed as threatened and endangered in recent years. Our analysis of listing rules found that climate change was determined to be a threat for 96% and 91% of all species listed in 2012 and 2013, respectively. The table below includes examples of species listed during 2006-2013 for which climate change was a listing factor. Climate change is also a growing threat to many threatened and endangered species that were first listed for other reasons.

Common name	Scientific name	Year listed
Elkhorn coral	<i>Acropora palmata</i>	2006
Staghorn coral	<i>Acropora cervicornis</i>	2006
Steelhead trout (Puget Sound DPS)	<i>Oncorhynchus mykiss</i> pop. 37	2007
Polar bear	<i>Ursus maritimus</i>	2008
Black abalone	<i>Haliotis cracherodii</i>	2009
Pacific eulachon (Southern DPS)	<i>Thaleichthys pacificus</i>	2010
DeBeque phacelia	<i>Phacelia scopulina</i> var. <i>submutica</i>	2011
Casey's june beetle	<i>Dinacoma caseyi</i>	2011
Miami blue butterfly	<i>Cyclargus thomasi bethunebakeri</i>	2012
Franciscan Manzanita	<i>Arctostaphylos franciscana</i>	2012
24 Hawaiian species		2012
Llanero coqui	<i>Eleutherodactylus juanariveroi</i>	2012
Choctaw bean	<i>Villosa choctawensis</i>	2012
Round ebonyshell	<i>Fusconaia rotulata</i>	2012
Southern kidneyshell	<i>Ptychobranthus jonesi</i>	2012
Alabama pearlshell	<i>Margaritifera marrianae</i>	2012
Fuzzy pigtoe	<i>Pleurobema strodeanum</i>	2012
Narrow pigtoe	<i>Fusconaia escambia</i>	2012
Tapered pigtoe	<i>Fusconaia burkei</i>	2012
Southern sandshell	<i>Hamiota australis</i>	2012
Hawaiian Islands false killer whale	<i>Pseudorca crassidens</i>	2012
Bearded seal (Beringia DPS)	<i>Erignathus barbatus</i>	2012
Ringed seal (Arctic DPS)	<i>Pusa hispida</i>	2012
38 Hawaiian species		2013
Diminutive amphipod	<i>Gammarus hyalleloides</i>	2013
Pecos amphipod	<i>Gammarus pecos</i>	2013

Diamond tryonia	<i>Pseudotryonia adamantina</i>	2013
Phantom tryonia	<i>Tryonia cheatumi</i>	2013
Gonzales tryonia	<i>Tryonia circumstriata</i> (=stocktonensis)	2013
Phantom springsnail	<i>Pyrgulopsis texana</i>	2013
Diamond darter	<i>Crystallaria cincotta</i>	2013
Gierisch mallow	<i>Sphaeralcea gierischii</i>	2013
Jollyville Plateau salamander	<i>Eurycea tonkawae</i>	2013
Austin blind salamander	<i>Eurycea waterlooensis</i>	2013
Jemez Mountains salamander	<i>Plethodon neomexicanus</i>	2013
Neosho mucket	<i>Lampsilis rafinesqueana</i>	2013
Rabbitsfoot	<i>Quadrula cylindrica cylindrica</i>	2013
Mount Charleston blue butterfly	<i>Plebejus shasta charlestonensis</i>	2013
Slabside pearlymussel	<i>Pleuonaia dolabelloides</i>	2013
Fluted kidneyshell	<i>Ptychobranhus subtentum</i>	2013
Acuna cactus	<i>Echinomastus erectocentrus</i> var. <i>acunensis</i>	2013
Fickeisen plains cactus	<i>Pediocactus peeblesianus fickeiseniae</i>	2013
Florida bonneted bat	<i>Eumops floridanus</i>	2013
Cape Sable thoroughwort	<i>Chromolaena frustrata</i>	2013
Florida semaphore cactus	<i>Consolea corallicola</i>	2013
Aboriginal prickly-apple	<i>Harrisia</i> (=Cereus) <i>aboriginum</i> (=gracilis)	2013
Blue-billed curassow	<i>Crax alberti</i>	2013
Brown-banded antpitta	<i>Grallaria milleri</i>	2013
15 Hawaiian species	<i>Vetericaris chaceorum</i>	2013
Spring pygmy sunfish	<i>Elassoma alabamae</i>	2013

In recent years, several species have been listed primarily because of climate change threats resulting from continued greenhouse gas emissions, including the polar bear in 2008, the bearded seal and ringed seal in 2012, and 20 coral species in 2014. The best-available science has concluded that the survival and recovery of these climate-vulnerable species depends on a return to lower atmospheric CO₂ concentrations than the present level of 400 ppm. As such, the massive greenhouse gas emissions stemming from the federal coal program are clearly not consistent with the survival and recovery of these species.

For example, NMFS' 2015 *Final Recovery Plan for Elkhorn and Staghorn Coral* includes a recovery criterion with specific targets for ocean temperature and ocean acidification conditions that must be achieved for these corals to survive and recover.³⁰⁶ As noted in the Final Recovery Plan, meeting this criterion is consistent with a return to an atmospheric CO₂ concentration of less than 350 ppm, as concluded by numerous scientific studies that have

³⁰⁶ NMFS. 2015. Recovery Plan for Elkhorn (*Acropora palmata*) and Staghorn (*A. cervicornis*) Corals. Prepared by the Acropora Recovery Team for the National Marine Fisheries Service, Silver Spring, Maryland. See Recovery Criterion 5: "Sea surface temperatures across the geographic range have been reduced to Degree Heating Weeks less than 4; and Mean monthly sea surface temperatures remain below 30°C during spawning periods; and Open ocean aragonite saturation has been restored to a state of greater than 4.0, a level considered optimal for reef growth."

examined coral species viability in response to ocean warming and ocean acidification.³⁰⁷ Recognizing the responsibility of all federal agencies to promote listed species' conservation, the Final Recovery Plan further includes a recovery criterion calling for the adoption of "adequate domestic and international regulations and agreements" to abate threats from increasing atmospheric CO₂ concentrations.³⁰⁸ The plan also includes a recovery action to "develop and implement U.S. and international measures to reduce atmospheric CO₂ concentrations to a level appropriate for coral recovery."³⁰⁹

Similarly, the 2015 Draft Polar Bear Conservation Plan acknowledges that the polar bear cannot be recovered without decisive action to mitigate the primary threat to the species—greenhouse gas ("GHG") emissions driving sea-ice loss:

The single most important step for polar bear conservation is decisive action to address global warming (Amstrup et al. 2010, Atwood et al. 2015), which is driven primarily by increasing atmospheric concentrations of greenhouse gases. Short of actions that effectively addresses the primary cause of diminishing sea ice, it is unlikely that polar bears will be recovered.³¹⁰

The best-available science on polar bear viability and sea-ice loss under climate change indicates that returning the atmospheric CO₂ concentration to ~350 ppm is needed for polar bear survival and recovery. Amstrup et al. (2010), published in the journal *Nature*, provides the best-available science on the greenhouse gas emissions pathways and atmospheric concentrations needed for polar bear recovery. This study found that polar bear probability of persistence increases when greenhouse gases are reduced significantly in the near future, and that the best-possible on-the-ground management to reduce other threats plays an important, although secondary, role in increasing persistence probabilities.³¹¹ Importantly, Amstrup et al. (2010) showed that the commitment scenario—in which CO₂ stays at a constant level of 368 ppm and radiative forcing remains at ~2.2 watts/m²—is consistent with polar bear recovery in all ecoregions. These findings are compatible with studies that have found that returning the

³⁰⁷ These studies include: (1) Veron et al. (2009) which recommends an atmospheric CO₂ concentration of less than 350 ppm to protect coral reef health, and suggests a target of 320 ppm which is the level that pre-dates the onset of mass bleaching events; (2) Donner (2009) which suggests an atmospheric CO₂ concentration target below 370 ppm to avoid degradation of coral reef ecosystems; (3) Simpson et al. (2009) which correlates a Caribbean open-ocean aragonite saturation state of 4.0, which is recommended by the plan, with an atmospheric CO₂ level at 340 to 360 ppm; and (4) Frieler et al. (2012) which shows that limiting warming to ~1°C above pre-industrial levels is needed to protect Caribbean coral reefs from degradation. A 1°C target is consistent with an emissions trajectory that peaks in the next few years at 400 ppm, declines sharply thereafter (~6% decline per year), and returns atmospheric CO₂ to below 350 ppm in the early 2100s (Hansen et al. 2013).

³⁰⁸ See Recovery Criterion 8.

³⁰⁹ See Recovery Action 9.

³¹⁰ U.S. Fish and Wildlife. 2015. Polar Bear (*Ursus maritimus*) Conservation Management Plan, Draft. U.S. Fish and Wildlife, Region 7, Anchorage, Alaska. 59 pp, at 6.

³¹¹ Amstrup, S.C. et al. 2010. Greenhouse gas mitigation can reduce sea-ice loss and increase polar bear persistence. *Nature* 468: 955-960. Because sea-ice habitat decreases relatively linearly with increases in mean global temperature rise in their models, the study concluded that the loss of sea-ice habitat and corresponding "declines in polar bear distribution and numbers are not unavoidable" if immediate and rapid GHG reductions were to be implemented, thus emphasizing the need for rapid, decisive action on emissions reductions.

atmospheric CO₂ concentration to between 350 and 400 ppm by 2100, and subsequently below 350 ppm, is needed to recover Arctic sea ice.³¹²

Because each significant new addition of greenhouse gases increases the extinction risk for many listed species, the massive greenhouse gas emissions stemming from the federal coal program, which contributes 13% of all US fossil fuel CO₂ emissions, clearly affect many listed species. The continuation of the federal coal program jeopardizes climate-change-vulnerable species, while an end to coal leasing on public lands would be consistent with their continued survival and recovery. As such, the Bureau must consult with the Fish and Wildlife Service and National Marine Fisheries Service on the impacts to listed species of the significant greenhouse gas emissions from the federal coal program.

VI. BLM Must Consider and Prioritize a Just Transition for Coal Mining Communities

In planning for the necessary phase-out of the coal leasing program, we call on the BLM to work to the maximum extent of its authority to minimize the adverse consequences on coal-dependent communities, and to help provide for a just and sustainable transition for those communities, who have contributed so greatly to powering the United States in the twentieth century and beyond. A key component of such a just transition is being honest with those communities in recognizing that the externalized costs of coal mining and combustion are too great for the nation and the world to bear. Yet the economic burden of the transition must not fall solely on the coal-reliant communities of the Powder River Basin and elsewhere, who have already borne disproportionate costs from automation, coal company bankruptcies, underfunded pensions, underfunded reclamation liabilities, and the public health effects of coal mining and combustion.

Therefore, we call on BLM to adopt commitment to prioritize providing support and assistance to help communities that are currently heavily reliant upon the federal coal program transition to more sustainable and prosperous economies. The Department of the Interior can play a key role in helping communities secure POWER Initiative grants (or any funding that may be authorized through the President's POWER+ Plan), direct resources to support conservation and research projects in or near communities, and encourage appropriate renewable energy development

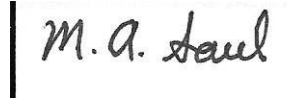
VII. Conclusion

We commend the Secretary and the BLM on their decision to undertake this long-overdue examination of the federal coal leasing program, including its climate and other environmental consequences, and to adopt a moratorium, at least in part, on new leasing pending that review. We hereby submit these scoping comments in an effort to assist the agency in preparing a thorough and robust review of the environmental consequences of the program, including initiating formal consultation with the Fish and Wildlife Service and National Marine Fisheries Service under the Endangered Species Act. We urge the BLM to give serious consideration to, and ultimately adopt, an alternative that would expand the moratorium to all unleased federal coal, and extend it indefinitely, or, at a minimum, until such time as BLM can conclusively

³¹² Hansen, J. et al. 2008. Target atmospheric CO₂: Where should humanity aim? *Open Atmospheric Science Journal* 2:217-231; Hansen, J. et al. 2013. Assessing "dangerous climate change": required reduction of carbon emissions to protect young people, future generations and nature. *PLoS ONE* 8: e81648.

demonstrate that additional federal coal leasing could be conducted in such a manner as not to impair the possibility of meeting national and global GHG mitigation goals.

Sincerely,

A handwritten signature in black ink that reads "M. A. Saul". The signature is written in a cursive style and is positioned to the right of a vertical line that starts from the top of the signature and extends downwards.

Michael Saul
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Utah Physicians for a Healthy Environment
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Subject: Coal PEIS Scoping Comments
Date: Thursday, July 28, 2016 5:07:12 PM
Attachments: [The Wilderness Society - Coal PEIS Scoping Comments 7-28-16-final.pdf](#)

Attached please find scoping comments from The Wilderness Society on the Coal Programmatic EIS. Thank you for your consideration.

Nada Culver

Senior Counsel and Director, BLM Action Center

The Wilderness Society

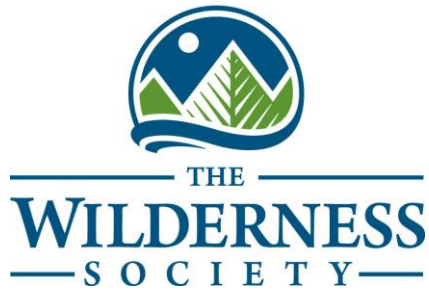
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July 28, 2016

Via electronic mail (BLM_WO_Coal_Program_PEIS_Comments@blm.gov)

Coal Programmatic EIS Scoping
Bureau of Land Management
20 M Street SE
Room 2134LM
Washington, D.C. 20003

Re: Scoping Comments for the Federal Coal Program Programmatic Environmental Impact Statement

To Whom It May Concern:

Please fully consider these scoping comments from The Wilderness Society regarding the Federal coal program Programmatic Environmental Impact Statement (PEIS) being prepared by the Bureau of Land Management (BLM). The Wilderness Society's more than 500,000 members and supporters nationwide care deeply about the management of our public lands. Founded in 1935, our mission is to protect wilderness and inspire Americans to care for our wild places. We appreciate the opportunity to submit these comments and the efforts the BLM is undertaking to review a program that has not been fully assessed for more than twenty years.

I. INTRODUCTION AND OVERVIEW

A. Evaluating and Reforming the Federal Coal Program – a Timely and Urgent Task.

Any and all coal leasing must be conducted "in the public interest." 30 U.S.C. § 201(a)(1). Accordingly, BLM cannot simply continue to lease and permit coal operations on public lands without evaluating the consequences of the program and considering needed changes. Further, public interest includes a wide range of social and environmental concerns, not just the interest or profits of private companies or simply dollars deposited in the federal treasury. As the Federal Land Policy and Management Act (FLPMA) acknowledges in the context of BLM's multiple use mandate, the public lands must be managed "with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output." 43 U.S.C. § 1702(c). We support the BLM's evaluation of the coal program in a manner that looks at the benefits from needed reforms in a holistic manner.

On March 17, 2015 Secretary of the Interior Sally Jewell asked for an “honest and open conversation” regarding the federal coal program. Her call was followed by a series of listening sessions in several communities, primarily in the west. In the State of the Union address on January 12, 2016 President Barack Obama announced,

Rather than subsidize the past, we should invest in the future—especially in communities that rely on fossil fuels. We do them no favor when we don’t show them where the trends are going. That’s why I’m going to push to change the way we manage our oil and coal resources, so that they better reflect the costs they impose on taxpayers and on our planet.

On January 15, 2016 Secretary Jewell announced plans to implement a “pause” on new federal coal leasing so that the federal coal program could be reviewed in a multi-year environmental review. The Secretary also issued Secretarial Order (S.O.) No. 3338 (Discretionary Programmatic Environmental Impact Statement to Modernize the Federal Coal Program) which formalized plans to implement the pause and to develop the PEIS.

In the S.O. three main concerns were identified that needed to be addressed in the PEIS: (1) concerns about fair return from the federal coal leasing program; (2) concerns about climate change due to federal coal production; and (3) concerns about market conditions affected by the federal coal program. In the notice of intent to prepare the PEIS (81 Fed. Reg. 17,720 (Mar. 30, 2016)), the BLM reiterated the issues that had been identified in the S.O. and also listed a number of approaches that were being considered for reforming the federal coal program, including: raising royalty rates, changing methods for determining fair market value for minimum bids on coal leases, raising rental rates, and changing the methodology for determining how much federal coal or acreage is made available for leasing. As noted above, this type of broad scope of review is needed to ensure that the coal program is meeting the public interest, including the important policy commitments made to balance energy development with conservation, ensure mitigation of impacts to the public lands, and to combat climate change.

As the BLM has noted, there have been prior reviews of the federal coal program where a leasing “pause” was put in place. These occurred in the 1970s into the 1980s. Programmatic environmental reviews were prepared as part of those assessments, and the reviews led to the development of the current BLM coal mining regulations, which have largely been in place since 1979. *See* 43 C.F.R. Part 3400 (presenting the BLM’s coal management regulations). Similar changes may be required to BLM’s regulations as a result of this PEIS, in addition to changes to existing policies and procedures that will not require formal rulemakings.

In recent years about 41 percent of the Nation’s coal was produced on federal public lands and this coal was used to generate about 14 percent of the Nation’s electricity in 2015. This coal is produced from 306 leases covering 482,691 acres of public land in 11 states, with 7.75 billion tons of coal estimated to be recoverable. Nevertheless, coal production has been dropping in recent years and this trend is predicted to continue. Coal production in the U.S. was 10 percent lower in 2015 than in 2014 (the lowest level since 1986) and the Energy Information Administration predicts coal production will drop another 12 percent in 2016. But coal reserves

currently under lease are estimated to be sufficient to continue production at current levels for 20 years. In 2012 as much as 21 percent of the Nation’s greenhouse gas (GHG) emissions originated from coal, oil, and natural gas extracted from the public lands, with coal contributing over 57 percent of this. Federally-produced coal is contributing roughly 10 percent to U.S. GHG emissions. While, based on the foregoing predictions, coal production is likely to continue to decrease, its impacts on public lands and contributions to GHG emissions remain significant; therefore, the federal coal program is in need of timely, comprehensive reform.

B. Principal Recommendations.

While we include specific recommendations with each section of these comments, we wanted to highlight some of the key recommendations for the preparation of the PEIS and reform of the federal coal program, which include:

- The coal program must be designed and implemented in the “public interest” and must provide a fair return to taxpayers.
- The process for determining lands “acceptable for further consideration for leasing” must be fully complied with at the land use planning and leasing stage, including applying and updating the unsuitability criteria, considering effects on other multiple uses and developing a reasonably foreseeable development scenario
- The BLM should “take control” of the federal coal leasing program and develop a multi-year leasing program that replaces the current, industry-driven lease by application process, and can incorporate applicable elements from the Solar PEIS and oil and gas Master Leasing Plans.
- BLM must put in place a regional mitigation strategy based on landscape scale analyses to support coal leasing decisions, and coal leasing must proceed only if it is shown there will be a “net benefit” to society resulting from leasing and development.
- BLM must address climate change impacts and commitments by tracking emissions, analyzing impacts, developing a carbon budget and applying compensatory mitigation where impacts cannot be avoided or sufficiently minimized.
- The PEIS should include planning for a future with declining coal production, addressing socio-economic impacts and considering tools to assist coal-dependent communities.

II. SCOPING IS A FUNDAMENTAL REQUIREMENT OF THE NATIONAL ENVIRONMENTAL POLICY ACT AND WILL HELP DEFINE THE PURPOSE AND NEED AND RANGE OF ALTERNATIVES FOR THIS PROGRAMMATIC EIS.

Scoping for preparation of an environmental impact statement (EIS) is required under the Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) regulations. 40 C.F.R. § 1501.7. It is to be an “early and open process.” *Id.* Scoping serves to identify the scope of the issues to address in an EIS, and the significant issues that are related to a proposed action. *Id.* §1501.7(a)(2). A number of mandatory and discretionary activities related to scoping are specified in the CEQ regulations, most importantly the need to fully engage with cooperating agencies, tribes, and the general public early in the scoping process.

Specifics of the scope of an EIS are also defined in the CEQ regulations. The scope of a project “consists of the range of actions, alternatives, and impacts to be considered in an [EIS].” 40 C.F.R. § 1508.25. The regulations state that scope consists of three types of actions, three types of alternatives, and three types of impacts. *Id.* Actions include connected actions, cumulative actions, and similar actions. Alternatives include the no action alternative, other reasonable courses of action, and mitigation measures that are not described in the proposed action. Impacts include direct, indirect, and cumulative effects. The three actions--connected, cumulative, and similar--are defined in detail in the regulations, and these will have particular significance for the consideration of climate change impacts of the federal coal program.

The BLM has also established requirements for scoping in its NEPA Handbook. BLM Handbook H-1790-1. Scoping is to help identify incomplete or unavailable information, help identify alternatives to be considered in the EIS, and refine the proposed action. BLM NEPA Handbook at 38. Importantly, scoping also helps initiate consideration of cumulative impacts. *Id.* BLM is to “use scoping to begin identifying actions by others that may have a cumulative effect with the proposed actions, and identifying geographic and temporal boundaries, baselines and thresholds.” *Id.* at 38 and 89. BLM views scoping as having both internal and external (to the agency) components, and external scoping “is to be used to identify past, present, and reasonably foreseeable actions by others that could have a cumulative effect.” *Id.* at 40. Connected and similar actions are recognized as important during scoping in the BLM NEPA Handbook. *Id.* at 39.

The scope of the analysis in the federal coal program PEIS will clearly have a significant role in defining the Purpose and Need for this project and the proposed action. It will also play a significant role in defining the alternatives considered in the PEIS. The Purpose and Need for this PEIS will be discussed later in these comments in section XI. Issues that should be considered in developing alternatives to consider in the PEIS will be addressed in section VII. Additionally, the recognition in the BLM Handbook that scoping is to be used to identify “reasonably foreseeable actions” has significance relative to defining the reasonably foreseeable development level of coal that can be expected from the federal coal program, an important issue that will be discussed in section IV.I. of these comments.

Recommendations: In discussing the scoping report that the BLM will provide, the agency’s factsheet provides that it “will release an interim report by the end of 2016 with conclusions from the scoping process about alternatives that will be evaluated and, as appropriate, any initial analytical results.”¹ The BLM’s scoping process should summarize input received and also provide initial information regarding purpose and need and alternatives so that the public can be informed regarding the direction the agency will take in completing this PEIS and BLM will have a roadmap to follow.

¹ See, FACT SHEET: MODERNIZING THE FEDERAL COAL PROGRAM, available at: http://www.blm.gov/style/medialib/blm/wo/Communications_Directorate/public_affairs/news_release_attachments.Par.47489.File.dat/Coal%20Reform%20Fact%20Sheet%20Final.pdf

III. OVERARCHING ELEMENTS OF THE COAL PROGRAM THAT SHOULD BE REVIEWED AND UPDATED IN THE PEIS

Due especially to the time since the last programmatic review, many of the central, underlying elements of the federal coal program need to be reviewed and updated in the PEIS. These include the definition of “public interest,” fair market value, royalties, rental rates, bonus bids, bonding standards and qualifications to hold a federal coal lease. Ensuring these elements are defined and updated in a manner that fulfills the BLM’s commitments and obligations as steward of our public lands is a vital part of ensuring the federal coal program is operated responsibly.

A. Operating the Coal Program in the “Public Interest” Should Be Explicitly Prioritized and More Clearly Defined.

All coal leasing is to be done “in the public interest.” 30 U.S.C. § 201(a)(1). The BLM should explicitly recognize this guiding purpose of the federal coal program in the PEIS and better define what the public interest means in this context, which is not limited to economic returns on coal leasing and development. FLPMA directs the BLM to consider a range of values in making land use allocation and management decisions and recognizes that looking solely at economic return is not sufficient. Public interest can often be served by managing for other uses, many of which may also provide economic benefits, such as recreation.

In many prior EISs the BLM has said that the public interest was served by coal leasing and development due to economic benefits that were predicted. But what has often been missing is a consideration of when there are *not* public benefits from coal leasing and development and there are benefits from more strictly managing those activities. In assessing how the public interest will be served, the BLM should give as much attention to a lack of benefits resulting from coal leasing and development activities, and/or the benefits from limiting them, as it does to the economic benefits from the activity. The negative externalities of coal development such as increased air pollution and water pollution and the destruction of natural landscapes and habitats should be recognized as *not* being in the public interest, while limiting them and providing more opportunities for protecting other values should be recognized as in the public interest. This analysis should factor in to deciding whether areas are or are not appropriate for leasing, as well as in deciding the terms of leases and other management of activities if areas are identified as appropriate for leasing. As part of the BLM’s “acceptable for further consideration for leasing” determination in its land use planning process, lands that would not further the public interest if they were leased (as opposed to managed for other uses) should be excluded from further consideration for leasing.

Recommendations: Serving the “public interest” is a lynchpin precept of the federal coal program and it must be recognized in all phases and aspects of the federal coal program, including when considering environmental protections. It should therefore be highlighted as a foundational consideration in the PEIS and explicitly defined to include not only the economic benefits from development but also the important context of resulting harms from development and benefits (economic and otherwise) from limiting development.

B. The Coal Program Must Yield a Fair Return.

In addition to the specific economic aspects of the federal coal program discussed in detail below, there is an overall mandate to achieve “fair return” from coal development. The most significant term that is used in the Mineral Leasing Act (MLA) as well as in the BLM coal regulations is “fair market value.”² No bid for a lease “shall be accepted which is less than the fair market value, as determined by the Secretary, of the coal subject to the lease.” 30 U.S.C. § 201(a)(1). *See also* 43 C.F.R. § 3422.1(c)(1) (same). The FLPMA establishes a policy that, “the United States receive fair market value of the use of the public lands and their resources” 43 U.S.C. § 1701(a)(9)

This concept is fundamental to the BLM coal leasing program and to federal coal development. It should therefore be explicitly addressed in the PEIS. The importance of achieving fair market value was recognized in both S.O. 3338 and in the BLM’s Federal Register notice of the development of the PEIS. Further, the White House Council on Economic Advisors released a report documenting the need for royalty reforms if taxpayers are to receive fair market value from the federal coal program. This report is called *The Economics of Coal Leasing on Federal Lands: Ensuring a Fair Return to Taxpayers* (June, 2016). The report notes that, “[a] review of the coal leasing program indicates that the program has been structured in a way that misaligns incentives going back decades, resulting in a distorted coal market with an artificially low price from most Federal coal and unnecessarily low government revenue from the leasing program.”

Concerns about fair market value were raised in 2013 in reports issued by the Government Accountability Office and the Department of the Interior’s Office of the Inspector General. These reports were noted in the S.O. The concern about fair market value stems from the fact that approximately 90 percent of lease sales receive bids from only one bidder, typically the operator of a mine adjacent to the new lease. In addition, the leasing of large amounts of low cost coal may be artificially driving down coal prices in the U.S. markets. Therefore, minimum bids that are not based on a competitive bidding process may not reflect fair market value. The BLM also identified potentially changing the methodology for determining fair market value when establishing the minimum bid or valuing lease modifications in the Notice of Intent, along with other issues related to fair return (some of which are discussed below). 81 Fed. Reg. at 17,726.

The Office of Natural Resources Revenue has recently released new rules that will regulate the valuation for royalty purposes of federally produced oil, gas, and coal. 30 C.F.R. Parts 1202 and 1206. Under the new rule, royalty valuation will be determined by point of sale at or near where the lease is located and will be based on arms-length contracts, which are the best indicators of market value. <http://www.onrr.gov/about/pdfdocs/20160630.pdf>. These new regulations also address aspects of fair market value for the federal coal program and can complement the additional actions BLM takes in the PEIS.

Recommendations: The BLM should highlight the need for the coal program to provide a fair return to taxpayers and use it as an overarching consideration in the PEIS. BLM should adopt

² “Diligent development,” “commercial quantities,” and “minimum bids” are also important concepts that arise here. *See generally* 30 U.S.C. § 202a(2); 43 C.F.R. Subpart 3487; 43 C.F.R. §§ 3480.0-6(d) and (d)(5) and Subpart 3483; 30 U.S.C. § 207(a); and 43 C.F.R. §§ 3430.1-1, 3430.1-2 (presenting these terms).

changes that will ensure this goal is met in analyzing each aspect of the program, including as recommended in further detail below. At a minimum, this includes showing fair market value is being achieved for each element of the program. However, since fair market value is a technical standard, we recommend that, overall, the program should ensure there is a fair return to taxpayers.

C. Royalty Rates Must Provide a Fair Return to Taxpayers.

Royalties must be paid on coal that is produced from federal coal leases. 30 U.S.C. § 207(a). Royalty rates are nominally 12.5 percent on coal mined from surface mines and 8 percent from underground mines. Unfortunately, however, the current effective rate of royalty payments is only 4.9 percent of the value of the coal that is mined—just \$ 1.70 per ton.³ It has been estimated that taxpayers have been shortchanged by nearly \$ 30 billion over the last three decades due to limited royalty, bonus bid, and rental payments from the federal coal program. Part of the reason for these low royalty payments is the availability of subsidies and deductions that lower the royalty rate. In total, because of these problems, Americans are not receiving the fair market value of their coal.

Consequently, there is likely a need to increase royalty rates on federally produced coal. One potential approach would be to apply the 18.75 percent rate that applies to oil and natural gas produced from offshore leases, which indicates a reasonable rate. The BLM should also consider an “add-on” to royalty rates that would reflect the negative externalities that the public is exposed to due to federal coal production, such as climate change problems (addressed in detail in section VI.G. below). The BLM should carefully consider raising the royalty rates on federally produced coal (both from surface mining and from underground mining) to a level that will help ensure the public receives the fair market value from federal coal.

The White House Council on Economic Advisors report on the coal program (discussed above) also states its findings “highlight the potential of royalty reform to provide a fair return to taxpayers while simultaneously reducing the environmental effects of coal extraction and combustion.” Modeling results presented in the report show that increasing royalty rates would increase government revenues while “only modestly reducing Federal coal production.” The report presents two possible royalty reform approaches, one based on the full market value of the coal and the other on setting royalty rates to maximize revenues to the taxpayer.

Recommendations: The BLM should raise royalty rates on federal coal production to ensure the public receives fair market value from its coal. An “add-on” could be placed on royalties that applies to externalities from coal production, such as emissions of the GHG methane. The PEIS should fully analyze mechanisms for increasing the royalty rate, such that any subsequent rulemakings to change the rates can rely on this analysis.

³ *An Assessment of U.S. Federal Coal Royalties. Current Royalty Structure, Effective Royalty Rates, and Reform Options.* Headwaters Economics. Jan. 2015.

D. Bonus Bids and Rental Rates Must Be Increased.

Two other revenue-producing aspects of federal coal leasing are bonus bids paid when offers are made for federal coal leases and the rental rates paid on federal coal leases. Bonus bids are amounts operators choose to offer when they bid on leases, but which are required to exceed the fair market value of the coal as determined by the BLM. 30 U.S.C. § 201(a)(1), 43 C.F.R. § 3422.1(c)(1). The current rental rate is \$ 3.00 per acre or fraction thereof. 43 CFR § 3473.3-1(a). These amounts are likely not being paid at a sufficient level to ensure the fair market value of federal coal is returned to the government. For instance, the Council on Economic Advisors report mentioned above finds that bonus bids are not providing fair market value for the coal. The BLM should carefully consider in the PEIS whether bonus bids and rental rates are sufficient on federal leases to ensure a fair market value return to the government, and it should initiate any necessary rulemaking that is needed to ensure there is a fair market value returned to the government. Issues related to the bonus bid that is being offered for federal leases will also be addressed in other sections of these comments, but suffice it to say here there is a significant question as to whether these bonus bids are sufficient to ensure fair market value is collected on leases by application (LBA) sales where an existing lessee is the sole bidder on the lease.

Recommendations: The BLM should carefully analyze bonus bids that are being paid for coal leases and rental rates that are paid on leases in the PEIS and determine how those should be increased to ensure that the government receives fair market value from federal coal production. Bonus bids that have been paid by sole bidders in LBA sales should receive special attention.

E. Bonding Levels Should Be Increased; Self-Bonding Should Be Prohibited.

Operators who acquire federal coal leases are also required to provide bonds to ensure their performance meets the terms and conditions of the lease and to ensure environmental protection, namely effective reclamation of disturbed lands. The first type of bond, the performance bond, is required by the BLM. The second type of bond, the reclamation bond, is required by the Office of Surface Mining Reclamation and Enforcement (OSMRE) and is intended to ensure the reclamation requirements of the Surface Mining Control and Reclamation Act (SMCRA) are met. The BLM bonds “shall be furnished in the amount determined by the authorized officer.” 43 C.F.R. § 3474.29(a). The BLM should determine in the PEIS whether current bonding amounts are sufficient to provide assurance that lease terms and conditions are being met. If needed these bonding levels should be increased.

The BLM should have assurance that lease terms and conditions will be met regardless of the future financial status of the operator, including evaluating previous reclamation performance and bond adequacy as part of bidder qualifications (as discussed in more detail below). This is especially important given the large number of bankruptcy petitions being filed by coal companies. If a rulemaking is needed to increase bond amounts, it should be initiated. If direction to state offices is needed, that should occur. The BLM should also consider the conditions of OSMRE reclamation bonds in the PEIS and receive assurance that there will be sufficient reclamation under these bonds, particularly where the BLM is the surface owner of the lands being mined. The BLM should help ensure that reclamation bonds are not released before reclamation is complete.

One issue that has become increasingly significant relative to bonding is the question of “self-bonding.” While this issue apparently applies to the OSMRE reclamation bonds, particularly as administered by the states, the BLM should consider this bonding issue in the PEIS. Self-bonding allows companies to avoid posting sureties as bonds and to instead rely on their company’s paper net worth to provide assurance of reclamation capabilities. But this has become increasingly problematic as the average share value for publicly traded coal companies has plummeted more than 80 percent in the past two years⁴ and as more than half the nation’s production capacity is now in bankruptcy proceedings⁵, leaving significant question as to whether self-bonded companies will have the capability to meet their reclamation obligations leaving taxpayers exposed to significant financial liability. This must not be allowed to happen. A promise to pay should not be allowed to substitute for a bond. Self-bonds are reported to now cover about \$3.75 billion in reclamation obligations in nine states.

This is a highly risky approach to ensuring reclamation obligations are met and it should not be allowed to continue. Under BLM’s bonding regulations the BLM is allowed to set bonding levels sufficient to “assure that the lease bond covers reclamation within a permit area” where the OSMRE tells the BLM that reclamation costs need to be covered because of the lack of a state program. 43 C.F.R. § 3474.3(b)(1). Given the failure of self-bonding, the BLM should strongly consider modifying this regulation to allow it to put in place reclamation bonds where self-bonding has previously been used to guarantee reclamation. The BLM should fully consider in the PEIS whether self-bonding should be permitted on federal lands, and in our view it should not be permitted. The PEIS should provide that the BLM will not lease to self-bonded companies, and if rulemaking is needed to implement this decision it should be initiated. This is the best way to ensure federal lands are reclaimed, as required by SMCRA.

Recommendations: The BLM should carefully consider needed bonding levels in the PEIS, both bonds to ensure compliance with lease terms and conditions, and bonding to ensure reclamation. If needed, bonding amounts should be increased. Assuring environmental protection objectives are achieved and that the companies faithfully meet their lease obligations should be guiding themes. The BLM should put in place a prohibition on the use of self-bonding to meet reclamation bonding requirements on the federal mineral estate.

F. Bidder/Applicant Qualifications Should Be More Detailed and Robust.

Another issue of concern that should be addressed in the PEIS are the requirements to hold a federal coal lease. Many of these are relatively common sense, like being a citizen of the United States or a corporation organized under the laws of the United States. 43 C.F.R. Subpart 3472. Other current requirements relate to limitations on acreage held, ensuring bidders or applications (collectively referred to as bidders) do not already have a coal lease that has not produced, and certifying compliance with applicable laws and regulations. While these are helpful

⁴ Based on performance of Dow Jones U.S. Coal Index as of July 28, 2016, available at <https://www.google.com/finance?cid=4931635>.

⁵ Kuykendall, Taylor and Ashleigh Cotting. “Companies recently filing bankruptcy produce more than 2/3 of PRB Coal.” SNL <https://www.snl.com/InteractiveX/Article.aspx?cid=A-36118340-12086>.

qualifications and limitations, additional criteria should be applied to bidders to hold a federal coal lease, including new leases related to existing mines.

In the Solar Energy Program, the BLM has expanded on its approach to ensuring the financial and technical capability of applicants. Instruction Memorandum No. 2011-060 (Solar and Wind Energy Applications – Due Diligence) elaborates on the BLM’s requirements, which are used to ensure that the agency thoroughly evaluates both financial and technical capabilities before proceeding with an application. A similar approach should be used to screen bidders for coal leases, ensuring that applicants have the financial means to develop and reclaim leases and the technical capability to do so without causing harm to the public lands.

In addition, bidders for coal leases should be further evaluated to ensure they have not been cited for violations of environmental regulations in connection with other operations and have been timely and completely fulfilling reclamation requirements. Finally, the BLM should not issue new leases to companies that already have ten or more years of reserves – those companies do not have an immediate need for access to additional coal and their holdings can further skew markets.

Recommendations: The BLM should strengthen requirements for companies bidding on leases to ensure that they have sufficient financial resources and technical expertise, have not been cited for violations of environmental regulations in connection with other operations, and have been fulfilling reclamation obligations in connection with other operations. Further, BLM should not issue leases to companies that already have ten or more years of reserves.

G. Reclamation Requirements Should Be Strengthened.

A central question related to the environmental protection needs in the federal coal program are reclamation requirements for lands disturbed by mining. While the OSMRE, and states that have been delegated authority, have primary responsibility to put in place reclamation plans pursuant to the SMCRA, the BLM, as a landowner, obviously also has important responsibilities in this regard. The PEIS should address reclamation needs and the degree to which those needs have been met on the federal mineral estate, especially on lands where the BLM holds surface ownership. It should seek to ensure that any unmet needs are met in the future.

No new mining should be permitted if there is not a reasonable likelihood reclamation needs and requirements will be met in a reasonable amount of time. The public should not have to wait for generations for its lands to be reclaimed. As provided for by SMCRA, reclamation should occur contemporaneously with mining, and this should be required by BLM-issued documents, as well.

While the OSMRE and the states may have primary authority to enforce reclamation requirements, the BLM does have obligations when it comes to reclamation. Under the MLA, operators must submit operation and reclamation plans to the BLM “[p]rior to taking any action on a leasehold which might cause a significant disturbance of the environment.” 30 U.S.C. § 207(c). This must be done within three years of a lease being issued. *Id.* BLM’s regulations governing surface management and protection provide that operators can only use surface areas that have been included in “an approved resource recovery and protection plan.” 43 C.F.R. §

3465.1(a). The BLM is given responsibility to enforce these resource recovery and protection plans. *Id.* § 3480.0-6(d)(5). The BLM should consider reclamation obligations in the PEIS and ensure they are being fully implemented.

A fundamental goal of the BLM’s reclamation enforcement actions should be to meet the environmental protection performance standards specified in SMCRA. 30 U.S.C. §1265. In particular, there is a need to ensure that reclamation activities on coal mines on BLM lands “restore the land . . . to a condition capable of supporting the uses which it was capable of supporting prior to any mining, or higher or better uses of which there is a reasonable likelihood . . .” *Id.* § 1265(b)(2). The BLM’s coal mining regulations also establish many environmental protection standards that should be fully met. *See, e.g.*, 43 C.F.R. § 3420.1-4(e)(3) (requiring areas considered acceptable for further consideration of leasing to be screened for compliance with multiple-use needs with “particular emphasis” given to protecting a number of specified resources). The PEIS should ensure there is protection for these environmental features and values by ensuring adequate reclamation standards and requirements are in place prior to leasing.

Finally, as discussed above, the BLM should not allow reclamation obligations to be met through self-bonding on federal lands and mineral estate.

Recommendations: Achieving successful, contemporaneous reclamation of lands disturbed by coal mining is a central feature of SMCRA and it should therefore be central to the analysis in the PEIS. The MLA and the BLM’s coal mining regulations also call for ensuring successful reclamation. The PEIS should therefore ensure that strong reclamation requirements are in place for the federal coal mining program, by rulemaking if necessary. The BLM should seek to meet a goal of restoring the land to the condition it was in prior to mining. As mentioned in the recommendation above, the BLM should prohibit self-bonding as a means to meet coal mining reclamation obligations on the federal mineral estate.

IV. HOW, WHEN, AND WHERE TO LEASE

A. Introduction.

S.O. 3338 committed to addressing the question of “how, when, and where to lease” in the PEIS and identified issues to consider such as the current approach to leasing in response to industry applications, whether lease sales should be scheduled, and whether zoning, as BLM incorporated into the Solar Energy PEIS, should direct where to lease. BLM’s Notice of Intent reiterated this commitment and also referenced the need to focus on the “unsuitability” criteria when determining where to lease. 81 Fed. Reg. at 17,725.

In deciding how, when and where to lease, BLM decision-making should:

- Ensure that the screening criteria outlined in its regulations are fully applied when the BLM evaluates whether areas might be “acceptable for further consideration for leasing” as part of its development of resource management plans (RMP); these criteria can also be applied at the leasing stage to address current conditions and new information.
- Ensure the BLM’s unsuitability criteria are fully applied at the leasing stage.
- Provide protections for lands with wilderness characteristics and Greater sage-grouse.

- Prepare a reasonably foreseeable development analysis of coal resources.
- Establish a regional leasing program that incorporates landscape level planning and more active BLM management, looking at examples such as the Solar PEIS and master leasing plans.
- Comply with NEPA and mitigation obligations to protect other resources and address other impacts, such as contributions to and effects of climate change.
- Address new and existing leases.
- Ensure that, in fulfilling these recommendations, the statutory and regulatory requirements that there will be “maximum economic recovery” from coal leasing and development need to be understood properly in the multiple-use context.

**B. Screening to Determine Tracts “Acceptable for Further Consideration for Leasing”:
Using a Landscape-Scale Approach to Avoiding Impacts.**

Under BLM’s coal mining regulations, coal cannot be leased competitively until it has been evaluated in a comprehensive land use plan or land use analysis. 43 C.F.R. § 3420.1-4(a). This analysis must be conducted pursuant to BLM’s planning regulations at 43 C.F.R. Part 1600, which requires development of an EIS to support the RMP. *Id.* § 3420.1-4(b)(1). In making the “major land use planning decision” concerning the coal resource resulting from this planning, which is “the identification of areas acceptable for further consideration for leasing,” four screening procedures that must be complied with are specified. *Id.* § 3420.1-4(e). The four screening criteria are:

1. Only areas that have “development potential” can be deemed acceptable for further consideration for leasing.
2. The BLM must assess whether the areas being considered for possible leasing are unsuitable for all or certain stipulated methods of mining, as provided for in the BLM’s unsuitability regulations. 43 C.F.R. Part 3460.
3. After application of the unsuitability criteria the BLM is to make further multiple-use decisions which “may eliminate additional coal deposits from further consideration for leasing” so as to protect other resource values and uses that are important or unique but not included in the unsuitability criteria. These multiple use considerations include those specified in section 522(a)(3) of SMCRA and the OSMRE regulations at 30 C.F.R. § 762.5. “[P]articular emphasis” is to be placed on protecting air and water quality, wetlands, riparian areas, and sole source aquifers, as well as Federal lands in the following systems: National Park System, National Wildlife Refuge System, National System of Trails, and the National Wild and Scenic River System.
4. In preparing the land use plan analysis, the BLM is to consult with surface owners who meet certain criteria “to determine preference for or against mining by other than underground mining techniques.”

43 C.F.R. §§ 3420.1-4(e)(1) to (e)(4).

Unfortunately, in the past the BLM often has not fully applied these screens in its land use planning process. The unsuitability criteria are often not applied—or final decisions on unsuitability is deferred—until later in the coal development process when leasing is actually

occurring or mine plans are being developed. Because of this approach, the further multiple-use considerations are also not fully applied during land use planning, even though this is the stage where land use allocations on the basis of the BLM's multiple use and sustained yield mandate are made. Clearly these additional considerations are an important means to ensure the environment is protected from coal development.

Further, making decisions at the land use plan level permits the BLM to make decisions in the context of a larger landscape, where the unsuitability criteria and multiple use considerations will more clearly apply to identify areas that should be protected from coal leasing. As prescribed in FLPMA, when creating land use plans BLM should:

- “consider present and potential uses of the public lands”;
- “consider the relative scarcity of the values involved and the availability of alternative means (including recycling) and sites for realization of those values”;
- “weigh long-term benefits to the public against short-term benefits.”

43 U.S.C. § 1712(c). These provisions supplement and bolster the provisions in the four screening criteria.

Waiting until the leasing stage to determine whether lands are actually better managed as unavailable for coal mining prevents the BLM from seeing the broader context of its decisions and the needs of the other resources in the planning area.

These oversight and analysis problems should be corrected at the RMP level. The BLM should update its land use planning practices to ensure that “acceptable for further consideration for leasing” decisions are fully informed by all of the relevant considerations, as envisioned by FLPMA and the coal regulations.

The BLM should adopt a new policy that would require the BLM to complete and document all 4 steps of the screening process as part of the land use planning process. Emphasis should be placed on ensuring there is full consideration of the specified multiple-use values rather than defaulting to leaving the vast majority of areas available for coal leasing. There is also a need for full compliance with and application of the unsuitability criteria at the land use planning stage. The new policy could also note the types of “land uses” to be protected by application of the multiple-use principles, including preference for renewable energy development and other uses that would have the effect of reducing the climate change contribution of coal from the federal lands.

For plans that were completed without making these determinations, the BLM would ensure that a more rigorous application of the criteria would be made prior to new leasing and commit to a schedule for updating those determinations and plans. For areas that currently have ongoing coal leasing and development, BLM should complete these updated analyses and amendments as part of the PEIS. We recommend the BLM address needed updates to the following RMPs in the PEIS:

- Miles City RMP, Montana,
- Buffalo RMP, Wyoming,

- Bighorn Basin RMP, Wyoming
- Kanab RMP, Utah,
- Uncompahgre RMP, Colorado (a Draft RMP was recently issued without a sufficient analysis; a supplement could efficiently incorporate appropriate analyses and updated decisions into the range of alternatives).

Recommendations: The PEIS should reiterate and require that when the BLM makes the “acceptable for further consideration for leasing” determination in its land use plans that it fully applies the four specified screening factors specified in its regulations *at the planning stage*, although additional information can certainly be considered at the time of leasing. In particular, the unsuitability criteria and consideration of additional multiple use values which “may eliminate additional coal deposits from further consideration for leasing” and which should be given “particular emphasis” should be fully applied at the planning stage such that the agency does not continue to default to keeping all lands available for coal leasing. As part of this planning, the BLM should also emphasize the potential impacts from precluding development of renewable sources of energy on the federal estate, which could assist in our transition away from fossil fuels. The PEIS should ensure that new leasing does not occur without further evaluation of the unsuitability criteria and multiple use considerations. Further, the PEIS should update the decisions in priority RMPs where ongoing leasing and development are most likely to address potential conflicts, as set out above.

C. Application of the Unsuitability Criteria Should Be Emphasized; Unsuitability Criteria Should Be Expanded.

One of the most significant environmental protections that applies to the federal coal program are the provisions for designating areas unsuitable for surface coal mining. These provisions are found in SMCRA. 30 U.S.C. § 1272. The BLM regulations also provide for designating federal lands as unsuitable for surface coal mining. 43 C.F.R. Subpart 3461.

Currently there are 20 criteria listed in the regulations that define areas as unsuitable for surface mining. 43 C.F.R. §§ 3461.5(a)(1) to (t)(1). In the PEIS the BLM should carefully review these criteria and determine whether new criteria should be added to the regulations. It seems apparent the current regulations are not comprehensive enough—there are many conditions that should make an area unsuitable for surface mining that are not recognized in the current regulations. For example, areas with important bat roosts and colonies should probably be made unsuitable. Important Greater sage-grouse habitats—priority habitat management areas (PHMA) and sagebrush focal areas (SFA)—should clearly be made unsuitable for coal mining. This change will likely also require amendments to the recent land use plan revisions the BLM put in to place for sage-grouse conservation, and this issue will be discussed further below.⁶ And perhaps most importantly, the BLM should consider designating areas unsuitable for surface mining where the coal mining would have significant climate change impacts. In particular, if an area can serve as important carbon sink it should not be available for coal mining. There are likely many other additions to the unsuitability criteria that should be made in the PEIS and related rulemaking.

⁶ See <http://www.blm.gov/wo/st/en/prog/more/sagegrouse.html> (presenting the BLM sage-grouse RMP revisions and amendments).

Under the BLM’s regulations, application of the unsuitability criteria and designation of areas that are unsuitable for surface coal mining is to take place at the land use planning stage. 43 C.F.R. §§ 3420.1-4(e)(2), 3461.0-6, 3461.3-1(b)(1) to (b)(2). Unfortunately, however, the BLM has not made decisions based on the unsuitability criteria at the planning stage. All too often the BLM defers application of these criteria when it develops an RMP. In the sage-grouse RMP revisions, for example, the BLM confirmed that priority habitat was “essential habitat for maintaining GRSG for purposes of the suitability criteria set forth at 43 CFR, Part 3461.5(o)(1)” but did not close any lands to future leasing. Rather, the plans state that “[a]t the time an application for a new coal lease or lease modification is submitted to the BLM, the BLM will determine whether the lease application area is “unsuitable” for all or certain coal mining methods pursuant to 43 CFR, Part 3461.5.” *See, e.g., Northwest Colorado Greater Sage-Grouse Approved RMP Amendment, p. 2-18.*

BLM has claimed that it delays unsuitability decisions because there is inadequate data allowing application of a criterion or an exception to it, and, as a result, will instead use “deferred criteria” that will not be applied until later in the coal development process. *See* 43 C.F.R. § 3461.2-1(b)(1). The BLM should carefully review how the unsuitability criteria have been applied to date and make improvements in this process so that the unsuitability criteria are fully and faithfully applied at the land use planning stage. Designating areas as unsuitable for coal mining is an important provision in section 522 of SMCRA as well as in the BLM’s coal regulations. These provisions should not be given short-shrift.

In addition to carefully considering how the 20 unsuitability criteria have been—or have not been—applied, and whether new unsuitability criteria are needed, the PEIS should also carefully review the exceptions and exemptions that are specified in the regulations for each of the criteria. The BLM should ensure that these “escapes” from the unsuitability criteria are fully justified and warranted, and applied in a fair and rigorous manner, which likely requires narrowing the type and application of exceptions.

Recommendations: Meeting the existing unsuitability criteria specified in the BLM’s regulations so as to determine areas that should not be available for coal mining is one of the most important environmental protection mechanisms that is available to the BLM. BLM’s regulations call for the application of these criteria when RMPs are developed. Unfortunately, however, the BLM has all too often deferred application of the unsuitability criteria at the planning stage. The PEIS should direct that the unsuitability criteria must be faithfully, and fully, applied when the BLM develops an RMP. Loopholes in the unsuitability criteria should also be scrutinized and narrowed as appropriate. In addition, the BLM should also consider whether the existing criteria are sufficient and develop new criteria as needed, such as to deal with climate change issues.

D. Lands with Wilderness Characteristics Should Be Addressed in the PEIS.

Lands with wilderness characteristics (LWC) have become increasingly prominent in BLM planning and decision-making, and are also likely to be destroyed where coal leasing is permitted. By definition, these lands have wilderness values of size, naturalness, and outstanding opportunities for solitude or primitive and unconfined recreation. In addition, they may also possess supplemental environmental values such as important historic sites or important wildlife

habitats. BLM's guidance requires the agency to maintain a current inventory of LWC and consider opportunities to protect and/or avoid harm to LWC in both land use planning and implementation decisions. See Instruction Memorandum No. 2011-154 and BLM Manual Sections 6310 and 6320.

Recommendations: The PEIS should fully consider LWCs and the potential impact of the federal coal program on these lands, including requiring updated inventory and evaluation of opportunities for protection of LWC prior to leasing. The important values of lands with wilderness characteristics are generally not present on other lands. The BLM should ensure the federal coal mining program seeks to protect these values.

E. Greater Sage-Grouse Should Be Addressed in the PEIS.

Ensuring sufficient protections for the Greater sage-grouse is a national priority of the BLM that culminated in revisions and amendments to land use plans in 10 states that are intended to conserve habitat and avoid the need to list the species. Many of the affected states, such as Montana, Wyoming, Colorado and Utah, also have significant federal coal deposits. Clearly sage-grouse protection should be an important consideration in the PEIS.

Under the current sage-grouse RMP provisions, the BLM is seeking to minimize new or additional surface disturbance by putting in place caps on development, minimizing surface occupancy from energy development, and identifying buffer distances around leks in important sage-grouse habitats. Unfortunately, however, these planning decisions did not actually close areas to coal leasing. This is a shortcoming that the PEIS should address and seek to correct.

Under the new sage-grouse RMPs, the most stringent protections are provided in PHMA and SFA. The PEIS should seek to ensure there are strong protections when a coal lease is located in a PHMA or SFA. If current protections relative to coal are not at least equivalent to what would be required if oil and natural gas development were proposed, that should be corrected. And finally, as mentioned above, new unsuitability criteria should be developed that would designate PHMA and SFA as unsuitable for surface coal mining.

Recommendations: The BLM through the PEIS, and any needed RMP amendments or revisions, should ensure sage-grouse are sufficiently protected through protections for PHMA and SFA, including making appropriate unsuitability determinations to close areas to leasing.

F. Environmental Protections Can and Must Be Applied to Existing Leases.

In addition to assuring that there are strong environmental protections for lands that might be deemed acceptable for further consideration of leasing, the BLM must also ensure that there are strong environmental protections applied to existing leases. There is a need to ensure that protections are in place for renewals of existing leases, for expansions of existing mines, lease exchanges, lease transfers, and for lease modifications. Both mitigation measures and other environmental protections must be applied to existing leases.

There are number of sources of authority that allow the BLM to ensure existing leases are managed to protect the environment. Prior to conducting operations that could disturb the environment, a lease holder must submit an operation plan and a reclamation plan. 30 USC 207(c). There is no reason these plans should not be subject to periodic review. The BLM is charged to “oversee exploration, development, production, resource recovery and protection, diligent development, continued operation, preparation, handling, product verification, and abandonment operations” 43 CFR 3480.0-6(d). This is a continuing obligation. This applies to exploration plans, resource recovery and protection plans, and other activities. *Id.* at 3480.0-6(d)(1)-(2). Compliance is to be assured by ensuring compliance with all applicable laws, regulations, and lease terms, and “approved exploration or resource recovery and protection plans” *Id.* 3480.0-6(d)(5).

In addition, the BLM’s standard coal mining lease provides that lessees must have “due regard” for the prevention of “waste, damage or degradation to any land, air, water, cultural, biological, visual, and other resources,” among other things. BLM Form 3400-12 § 7. “Lessees must take measures deemed necessary by lessor to accomplish the intent of this lease term.” *Id.* Prior to the termination of bond liability, and at other times, lessees must “reclaim all lands the surface of which has been disturbed” *Id.* §10. Leases are made subject to the terms of the Clean Water Act and the Clean Air Act, as well as SMCRA. *Id.* §14. A number of additional special environmental protection stipulations are attached to many coal leases. Lease terms are subject to readjustment on specified terms. 43 C.F.R. 3451.1(a)(1).

Recommendations: BLM has ample authority to apply needed mitigation measures and other environmental protections on existing leases, not only at the time of renewal, modification or transfer, but also for ongoing approvals of development. BLM can also provide for shorter readjustment periods than those in the current regulations, and should initiate any required rulemaking.

G. The BLM should look to its Solar PEIS and Oil and Gas Master Leasing Plan policy as Models for Landscape-scale Guided Development and Avoidance that could be Incorporated into the Coal PEIS.

In updating its approach to managing leasing of federal coal resources, BLM can look to recent programmatic and policy decisions for managing development of federal solar and oil and gas resources. Both the Solar PEIS and the agency’s Master Leasing Plan (MLP) policy provide methods for proactively managing leasing to reduce conflicts, protect other values, and guide development to the right places.

1. The Solar PEIS.

The Solar PEIS provided a framework for solar energy development that updated the BLM’s existing approach, which simply responded to applications submitted by developers for rights-of-way. The Solar PEIS ultimately made a number of decisions that can and should be considered for updating the agency’s approach to leasing in the Coal PEIS, including:

- Identifying Solar Energy **Zones** (SEZ) that are “relatively large areas that provide highly suitable locations for utility-scale solar development: locations where solar development is economically and technically feasible, where there is good potential for connecting new electricity-generating plants to the transmission distribution system, and where there is generally low resource conflict.” Solar Final PEIS, pp. ES-7 – ES-11. Similarly, the Coal PEIS could identify areas that are “highly suitable” for coal in terms of having high resource potential and low resource conflicts, while also being economically and technically feasible.
- Identifying **exclusion areas** from solar development, which “allows the BLM to support the highest and best use of public lands by avoiding potential resource conflicts and reserving for other uses public lands that are not well suited for utility-scale solar energy development.” Solar Final PEIS, p. ES-7. These areas are significant because of “the size and scale of utility-scale solar energy development (typically involving a single use of public lands).” *Id.* Instead of leaving the vast majority of lands open to coal leasing, the BLM can and should identify categories of lands that should be excluded, especially since coal mining also limits the use of land to a single use.
- Identifying **variance lands** that could be made available subject to a stringent process and showing of need in case the SEZs are “insufficient to accommodate demand.” Solar Final PEIS, p. ES-14.
- Incorporating **programmatic design features** that would be incorporated into all future development in order “to avoid or reduce adverse impacts.” Solar Final PEIS, p. ES-6. Similarly, incorporating mandatory best practices for coal development could reduce environmental impacts.
- Setting out a **mitigation framework** and incorporating the mitigation hierarchy of avoidance, minimization and offset/compensation and preparation of regional mitigation strategies through the following actions:
 - “Avoidance will be achieved through siting decisions and the identification of priority SEZs.”
 - “Minimization will be achieved through the application of design features and adherence to applicable federal, state, and local laws and regulations such as the Endangered Species Act (ESA).”
 - “For those impacts that cannot be avoided or minimized, the BLM will determine, in consultation with affected stakeholders, if measures to offset or mitigate adverse impacts would be appropriate.”
 - “BLM proposes to establish regional mitigation plans that will facilitate development in SEZs. As envisioned, these regional mitigation plans will simplify and improve the mitigation process for future projects in SEZs.”
 Solar Final PEIS, p. ES-6. Mitigation should similarly be incorporated into the Coal PEIS, including a regional mitigation strategy to evaluate and design needed mitigation at the programmatic level.

2. Master Leasing Plans.

Master Leasing Plans are created at a smaller landscape level to manage oil and gas development, focusing on areas where there are likely impacts to and potential conflicts with

other resources. *See*, Handbook H-1624-1 (Planning for Fluid Mineral Resources), Chapter V. MLPs incorporate a number of tools to reduce conflicts and guide development to appropriate areas that could be incorporated into the Coal PEIS, including:

- Identifies **resource condition objectives** to provide standards for subsequent development and reclamation; these may apply to management for air quality, wildlife habitat, riparian areas. H-1624-1.V.C.1. Setting standards prior to approving coal leasing and development will enable BLM to identify and address potential impacts.
- Incorporates **resource protection measures** to reduce environmental impacts and help achieve resource condition objectives. These measures may include closing areas to leasing, phased leasing, or other lease stipulations or conditions of approval restricting the timing, location, or method of operations; or conditions of approval. H-1624-1.V.C.2. In practice, these measures have included prioritizing mineral leasing in areas with high development potential and minimal resource conflicts, and using phased leasing and development, which can be accomplished through identifying areas to be leased in order and by using limitations on the amount of cumulative surface disturbance that can occur and requiring reclamation prior to additional development. These types of approaches could be used as part of managing both leasing and development in the Coal PEIS.
- Extends to **BLM surface and split estate** lands. *See*, Instruction Memorandum 2010-117. The Coal PEIS can and should address leasing and development of federal coal resources including where BLM may not manage the surface.
- Extends to both **new and existing leases**. H-1624-1.V.C.2. The Coal PEIS can and should incorporate protective measures, including mitigation, which will apply to new leases and approvals of development on existing leases.

Most of these key concepts are embedded in coal regulations and policy already, including the unsuitability criteria, multiple use considerations, special stipulations for leases, and “due regard” language in standard lease terms and the regional leasing framework.

Recommendations: The BLM should evaluate the key elements discussed above from the Solar PEIS and MLP policy and incorporate them into a proactive approach to managing where, when and how leases are issued and developed. Protective management conditions can be incorporated into new leases via special stipulations and into existing leases through the mechanisms discussed above. BLM has the overarching authority to put similar measures into place to identify the best places for development; protect places that are not suitable for development; and manage development by controlling when, where and how leasing and development occur through tool like phased leasing, phased development, and required best practices.

H. The BLM Must Take Control of the Federal Coal Leasing Program to Obtain a Fair Return.

BLM needs to take a more proactive role in managing leasing and development of coal resources on public lands to ensure that the coal program achieves the goals laid out in S.O. 3338 and underlying statutory authority, including ensuring a fair return to taxpayers, best meeting

national energy needs, achieving U.S. carbon emission reduction goals, and improving protection and management of the many values of our public lands.

The agency should use its broad authority to take control of the Federal Coal Leasing Program through an updated regional coal leasing process to better plan for and manage the leasing and development of publicly-owned coal resources.

1. The current leasing approach has widely-known deficiencies.

The Department of the Interior has broad discretionary authority to decide where, when, and under what terms and conditions, coal development should occur. Under existing regulations, the Secretary can set leasing levels and determine potential coal leasing tracts based upon regional land use planning, expected demand for coal resources, and potential environmental and economic impacts that could result from leasing. 43 C.F.R. § 3420.2.

Yet since 1990, all federal coal leasing has been conducted through a lease-by-application process where coal companies propose tracts of land they are interested in developing to be leased by BLM. In most cases, the lease tracts applications are adjacent to companies' existing coal mines. These take the form of either a lease modification which are non-competitive modifications of existing leases to add contiguous lands of as much as 160 acres or Lease by Application (LBA) for specific tracts delineated by the applicant. More than 90 percent of the lease applications the BLM has received have been for these "maintenance tracts" used to extend the life of an existing mine or to expand that mine's annual production. And in all but one case over the last 25 years, the company that applied for a lease was the only—and the successful—bidder for the tract. This approach makes setting a fair price for the leases very difficult and allows coal companies to set the timing, location, and size of leases.

The consequences of letting industry set the pace, scale and location of lease sales have been well documented. Numerous independent audits and third party reviews from 1980 to 2014 have found that the program does not provide a fair return to taxpayers, concluding that "There is no evidence that the BLM receives a market price for the coal,"⁷ "weaknesses in the current sale process . . . could put the Government at risk of not receiving the full value for the leases,"⁸ and the BLM "does not obtain fair market value for taxpayers. It seldom generates competitive bids, and studies indicate that the resulting losses are substantial."⁹

BLM does not adequately limit lands open to development to appropriate lands. As we outlined in Section IV. B., BLM does not fully consider the full range of multiple-use values during land use planning. An example of this problem in practice is the Buffalo RMP under which "All coal lands are open to exploration, subject to multiple use constraints, resulting in zero acres closed to coal exploration and 4,775,136 acres open to coal leasing. . . ."¹⁰

⁷ Institute for Energy Economics and Financial Analysis, "The Great Giveaway: An analysis of the costly failure of federal coal leasing in the Powder River Basin," June 2012.

⁸ U.S. Department of the Interior Inspector General's Report, "Coal Management Program, U.S. Department of the Interior," June 2013.

⁹ Taxpayers for Common Sense, "Federal Coal Leasing: Fair Market Value and a Fair Return for the American Taxpayer," September 2013.

¹⁰ Buffalo Resource Management Plan Final Environmental Impact Statement, 2015, p. 123.

To address these problems, BLM should consider replacing the existing LBA leasing system with a modern approach that creates mechanisms to ensure a fair return, ensures any new leasing is based on a full consideration of other resources, and provides BLM with tools to achieve national policy priorities such as combating climate change.

2. BLM has authority to manage leasing differently.

As we have emphasized repeatedly in these comments, the BLM has wide latitude to craft the requirements that apply to the federal coal leasing and development program. The Secretary of the Interior has complete discretion to issue leases, which must meet the “public interests.” 30 U.S.C. § 201(a)(1). Besides provision for rentals, royalties, and a limitation on the lease term to 20 years, subject to production requirements, “[t]he lease shall include such other terms and conditions as the Secretary shall determine.” *Id.* § 207(a). Using this broad authority, the BLM has put in place the federal coal mining regulations at 43 C.F.R. Part 3400 which govern all facets of federal coal mining, including: exploration; competitive lease sales; LBAs; split estate leasing; non-competitive lease sales; lease modifications; mining licenses; coal lease management; environmental protection; lease qualification requirements; provisions for fees, rentals, and royalties; lease terms, etc. These regulations were generally put in place in 1979 with some later revisions under the authority provided by the MLA, Mineral Leasing Act for Acquired Lands of 1947, FLPMA, SMCRA, and other statutes. *See* 44 Fed. Reg. 42584 (July 19, 1979) (stating these statutes formed the basis for the BLM’s coal regulations, which were finalized in this rulemaking). *See also* 43 C.F.R. § 3400.0-3. Given the sweeping scope of the agency’s statutory authority and current regulations, BLM can make needed revisions and put in place new regulations to improve fair return, reduce climate emissions, and better protect affected lands and resources.

3. BLM should develop a new, multi-year approach for coal leasing and development.

BLM should use the PEIS to develop a new, multi-year approach for the leasing and development of federal coal in the West. This will likely require some new regulations but can be developed and subjected to NEPA analysis in the PEIS. Under a new approach, BLM would initiate new leasing activity based on market circumstances, progress on climate objectives and other considerations; determine where coal leases will be considered and screen for potential conflicts; develop new methods for selling coal resources in collaboration with the industry and leading economic experts; enhance the assurances that potential lessees have the financial and technical capabilities to viably operate the lease in question for its anticipated duration; and issue leases for specific tracts.

a. *Establish a Western Coal Production Region.*

In order to create a unified approach to coal leasing and to allow the BLM to manage the amount and timing of coal lease sales, the BLM should create a Western Coal Production Region based on the region as defined by the Energy Information Administration (EIA). EIA defines the Western coal region to include Alaska, Arizona, Colorado, Montana, New Mexico, North Dakota, Utah, Washington, and Wyoming.¹¹ According to the latest state-specific data from

¹¹ *See* U.S. Energy Information Administration, <http://www.eia.gov/tools/glossary/?id=coal>.

EIA's *Annual Coal Report*, of the coal produced in the United States in 2014, 54 percent was produced in the Western coal region, with Wyoming producing the lion's share: 73% of the coal mined in the Western coal region.¹² This region also encompasses 94 percent of the leases BLM had on record in 2015.¹³

Given significant differences in the geology, coal rank and quality, and mining conditions within the Western Coal Production Region, the BLM could consider special circumstances faced by mine-mouth power plant situations, where coal rank and value may be low, but the lack of transportation costs creates unique captive markets. Any exception process for mine-mouth plant situations would have to consider the climate change implications of extending leasing and operations of the plant and the socio-economic dislocations associated with continuing or restricting coal availability for the local community (as discussed in Section VIII).

For coal resources outside the western region, BLM should consider whether to create an eastern coal leasing region and apply new leasing approaches to those areas as well.

b. Prioritize where coal leases will be considered.

As described in Section IV.B., BLM should determine where additional leasing should be given "particular emphasis" and "eliminate additional coal deposits from further consideration for leasing" within RMPs, or for areas where such determinations have not been made, as part of the 5-year plans. Within the Western Coal Production Region, BLM should prioritize revising land use plans in areas where there are active coal mines.

c. Specify the size and timing of potential leasing activity.

The BLM should significantly modify the orientation of the agency to the industry in reforming the federal coal program. As the dramatic, rapid changes in the coal industry over the past two years have shown, federal lands deserve a more objective arbiter of whether, where and when additional coal resources should be put on the block for development. To accomplish this, the BLM should assume a greater role in specifying the size and timing of potential leasing activity that the Secretary of the Interior determines will best meet national energy needs, achieve U.S. carbon emission reduction goals, and ensure a fair return to taxpayers.

Under this approach, BLM would set the total amount of coal resource available for sale by auction each year consistent with a 5-year plan. There is precedent within BLM and elsewhere with the Interior Department for such a program: the Bureau of Ocean Energy Management (BOEM) has a Five-Year Program for oil and gas development. It establishes a schedule of oil and gas lease sales proposed for planning areas of the U.S. Outer Continental Shelf (OCS). The Program specifies the size, timing, and location of potential leasing activity that the Secretary of the Interior determines will best meet national energy needs. BOEM also has a leasing program

¹² See Table 1 in U.S. Energy Information Administration, *Annual Coal Report 2014*, March 2016. Available at <http://www.eia.gov/coal/annual/pdf/acr.pdf>. (Accessed July 26, 2016.)

¹³ Cross Reference of BLM Coal Lease Serial Numbers and MSHA Identification Numbers, Feb. 3, 2015. BLM FOIA# 2015-00462. Mark Haggerty, Headwaters Economics, pers. comm.

for its off-shore renewable energy that incorporates a multi-phase leasing process. We recommend the BLM seriously consider the five-year planning process for use in determining how much and which coal resources should be made available on a shorter time horizon than afforded by the PEIS.

In these five year plans, the BLM could set production targets for the total amount of coal resource sales that would be needed to meet declining coal production demand from public lands. The BLM should also consider carbon performance for coal's allocated share of all federal lands energy under a "carbon budget" calibrated to leading domestic and international climate goals. Our views on the need for a carbon budget are discussed in section VI.E. of these comments.

d. An Immodest Proposal: Auction coal resource allocations (credits) within the Western Coal Production Region.

To overcome the problems related to assuring a fair return for coal in a declining market dominated by incumbent mines leasing coal adjacent to their existing mines, BLM should develop an alternative bidding program for allocating federal coal in the Western Coal Production Region. BOEM has studied different auction systems for issuing renewable energy leases, easements, and rights-of-way on the OCS that may provide models for BLM to look at as it modernizes its coal leasing program.¹⁴

One approach to selling coal rights would have BLM auction coal resource allocations (or lease credits) rather than specific tracts for lease. BLM could specify the amount of coal made available for lease in terms of a total British thermal units (Btu) value, to establish basic parity among different areas within the leasing region. Because the quality of coal resource varies tremendously from one location to another, using a more static unit of measurement such as acres of land or tons of coal as the limit on the amount available for lease would disproportionately affect and disadvantage mines or companies producing lower quality coal. Btu content measures the heating value of the resource and therefore reflects the need for a larger amount of acreage or tons of coal to be developed to reach that limit in poorer quality areas. Additionally, leasing based on total Btu allows the BLM to easily track and measure potential GHG emissions from approved leases and compare that to the agency's climate targets or goals under the carbon budget discussed in section VI.E.

During this phase of the program, the sale of coal resource allocations (or lease credits) gives the successful bidder the right to subsequently seek BLM approval for the development of a leasehold. The lease credit does not grant the holder the right to construct any facilities; rather, the lease credit grants the right to develop a lease application and plan of development, which must be approved by BLM before the project can move on to the next stage of the process.

¹⁴ BOEM issued a contract to Power Auctions, LLC to study different types of auctions for wind rights. The study has been published in three parts, and is available at the links below:

- [Auction Design for Wind Rights](#)
- [Multiple Factor Auction Design for Wind Rights](#)
- [Comparison of Auction Formats for Auctioning Wind Rights](#)

A coal resource allocation auction system would help to convey coal resource allocations (credits) to entities most likely to successfully develop the resources and to meet the statutory requirement to obtain a fair return on coal sales. It could also provide a mechanism for reducing the carbon consequences of the federal coal program by putting BLM in charge of the pace and scale of coal allocation sales.

BLM should develop new auction formats to implement the new program and address important program performance goals. Performance measures developed by BOEM for its auction process for Wind Energy Areas¹⁵ could be applied to BLM's approach:

- Economic Efficiency: The auction process should try to ensure that future federal coal sales are awarded to those who value the coal resource the most because these entities would likely be the most efficient at using the resource;
- Fair Return: BLM is statutorily required to obtain a "fair return" for coal resources.
- Program Efficiency: The coal auction process must be manageable for BLM to administer;
- Lease Boundary Flexibility: Within constraints fixed by BLM, the auction should allow bidders to apply coal allocations to the optimal lease areas;
- Competition: The auction process must be fair, and encourage participation from all interested bidders while minimizing the opportunity for collusion among bidders;
- Transparency: The auction process must be an open one in which bids are comparable and the reason why the winners won is clear;
- Neutrality: The auction process must ensure that all bidders are treated equally;
- Simplicity: The auction process must be easily understood and implemented, for both the bidders and BLM; and
- Consistency: The auction process should be applicable to the issuance of leases in a variety of contexts.

e. Issuing specific leases to exercise coal credits.

Once sold, the credits could then be applied to specific lease tracts in the Western Coal Production Area identified by the successful bidders from within lands made available to leasing by the BLM. Though the selection of tracts would look similar to what those companies would propose under the lease by application system, allocations would have to be within areas pre-screened by BLM and BLM would not have to determine the fair market value at this stage—it will have been determined at the auction stage. BLM would still have to determine the Btus contained within a specific tract, but the agency could do that in a public and transparent way since there would not be bidding on the specific lease tract.

Under this, or any leasing system, BLM must continue to ensure full NEPA compliance by preparing an EIS for coal leases, which is also envisioned by the current regulations. *See* 43 C.F.R. § 3420.3-4(c) (stating that "[a]fter tract ranking and selection, a regional lease sale environmental impact statement . . . shall be prepared" by the BLM in accordance with NEPA). These EISs would consider the site-specific impacts at each tract and the regional cumulative

¹⁵ <http://www.boem.gov/Renewable-Energy-Program/Regulatory-Information/RenewableEnergy-Auction-Formats.aspx>

environmental impacts of the proposed lease, including other coal and non-coal development activities. 43 C.F.R. § 3420.3-4(c)(1) to (c)(2). It would be important to maintain this NEPA compliance both so that environmental issues can be dealt with and so that the public can be fully engaged.

Finally, the BLM should abandon the use of Regional Coal Teams and instead determine regional leasing needs based on expert analysis.

Recommendations: The BLM should carefully analyze the current coal leasing system in the PEIS and develop new regulations to modernize the process, incorporating elements from the Solar PEIS and oil and gas Master Leasing Plans discussed above. The agency should terminate the LBA leasing system and replace it with a Western Regional Coal Leasing Program that incorporates some of the principles from the current regulations but is updated to reflect current knowledge and policy. This regional system should evaluate bidding on individual tracts with bidding on an amount of coal that the BLM has determined should be available for development. This leasing system should be consistent with the carbon budget recommendations we make elsewhere in these comments. This new system could be put in place based on five-year plans of development similar to the system used in Outer Continental Shelf oil and gas leasing. These plans of development should be designed to meet national program objectives and done from a Western Regional perspective, not a local one. The BLM should also abandon the use of Regional Coal Teams and instead determine regional leasing needs based on the BLM's expert analysis. The provisions for NEPA compliance should be maintained in the regional coal leasing program. In all cases this leasing system must ensure the federal government achieves a fair market value for the federal coal it leases.

I. BLM Should Prepare a Reasonably Foreseeable Development Scenario.

An important issue that BLM must address in the PEIS is the Reasonably Foreseeable Development (RFD) level for federal coal that is likely in the next several decades. RFD is a term that is routinely used when the BLM considers oil and gas development activities, but is also used in other contexts, including for coal and as part of the Solar PEIS. As mentioned in section I above, where we discussed scoping issues, the BLM's NEPA Handbook says that in scoping the BLM should identify "reasonably foreseeable actions." This is essentially direction that the BLM consider coal RFD in the PEIS.

An RFD is essentially a long-term projection of exploration, development, production, and reclamation. Activity that can inform the development of alternatives, analysis of environmental consequences, and selection of a management approach are all affected by the RFD analysis. The summary of an RFD in BLM's guidance related to planning for oil and gas development highlights the need for an RFD as part of the Coal PEIS:

A Reasonably Foreseeable Development Scenario:

1. Is based on a reasonable, technical, and scientific estimate of anticipated oil and gas activity based on the best available information and data at the time of the study.
2. Provides the RMP/NEPA process with information needed in the review and

- evaluation of existing management direction and alternatives for a land use plan or plan amendment.
3. Facilitates informed decisions on the management of oil and gas resources balanced with management of other resources.
 4. Provides an effective tool to determine the need to update or revise the NEPA document upon which a management plan is based.
 5. Includes an evaluation of interrelated activity resulting from oil and gas exploration and development efforts regardless of land ownership or jurisdiction.
 6. Provides information necessary for the identification and assessment of alternatives in a NEPA document.
 7. Provides technical information for analyzing cumulative effects from oil and gas activity that could be reasonably expected as a result of a BLM decision.
 8. Is prepared by specialists with technical and scientific oil and gas experience and qualifications (Petroleum Geologists and/or Petroleum Engineers with assistance from experienced Minerals Resource/Natural Resource Specialists as needed).
 9. Is documented in a report subject to peer review.
 10. Will be included in the administrative record of any analysis for which it is used.
 11. Is a technical report that supports NEPA and planning documents that can be challenged through the administrative review process.

Instruction Memorandum No. 2004-89, Attachment 1-3.

NEPA dictates that BLM take a “hard look” at the environmental consequences of a proposed action and the requisite environmental analysis “must be appropriate to the action in question.” *Metcalf v. Daley*, 214 F.3d 1135, 1151 (9th Cir. 2000); *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 348 (1989). In order to take the “hard look” required by NEPA, BLM is required to assess impacts and effects that include: “ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, *whether direct, indirect, or cumulative.*” 40 C.F.R. § 1508.8. (emphasis added). NEPA regulations define “cumulative impact” as:

the impact on the environment which results from the *incremental impact of the action when added to other past, present, and reasonably foreseeable future actions* regardless of what agency (Federal or non-Federal) or person undertakes such other actions. *Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.*

40 C.F.R. § 1508.7 (emphasis added).

To satisfy NEPA’s hard look requirement, the cumulative impacts assessment must do two things. First, BLM must catalogue the past, present, and reasonably foreseeable projects in the area that might impact the environment. *Muckleshoot Indian Tribe v. U.S. Forest Service*, 177 F.3d 800, 809–10 (9th Cir. 1999). Second, BLM must analyze these impacts in light of the proposed action. *Id.* Therefore, there is no doubt the BLM must consider the likely level of

federal coal development that can be anticipated in the future. Tools and data are available that allow assessments of likely demand levels under different scenarios, so the amount of coal that will be demanded and potentially mined can also be estimated. Knowing how much coal will potentially be demanded and produced from federal coal leases under different scenarios is clearly a fundamental area of information that both the agency and the public should have available if informed decision-making is to occur.

The BLM has developed a forecast of reasonably foreseeable coal, coal-related, and other industrial development (RFD) in the Powder River Basin. As recently as 2011, BLM put out an RFD for the Powder River Basin for use in evaluating cumulative impacts in future NEPA documents as part of the Powder River Basin Coal Review.¹⁶ The RFD summarizes “the past and present energy-related development activities that have occurred in the PRB through the end of 2008 and the projected RFD activities for future years 2020 and 2030.”¹⁷ The BLM should develop an RFD for the entire federal coal program, encompassing all mines and leases for federal coal as part of the PEIS, but it must improve upon the methods used in the Powder River Basin Coal Review.

The Powder River Basin Coal Review RFD inaccurately predicted production levels. The 2011 RFD generated two scenarios—the lower and upper production scenarios, both of which assumed an increase of coal production in both Montana and Wyoming by 2030. Yet since 2011 (and the base year of the study 2008), coal production from the Powder River Basin has declined. The two production scenarios were based on information from 2010 projections of U.S. electricity consumption (IHS Global Insight (2010)), total Powder River Basin annual production projections (Wood McKenzie (2010)), global electricity consumption (International Energy Agency (2010)), U.S. Energy Information Administration (2010) and information provided by Powder River Basin coal mine operators and regulatory agencies. But most importantly the RFD is based on the history of production levels from 1990 to 2009, which “increased at an average rate of approximately 4.5 percent per year.” (Task 2, p. 3-2). And it assumes a robust international export market. (Task 2, p. 2-4). The RFD also assumes that certain speculative projects, including a mine-mouth coal to liquids plant (for example, the Many Stars Project in Montana), coal gasification projects (for example, the School Creek Mine proposal in Wyoming), lease development at the Otter Creek mine in Montana for export, and continued constant production at the Rosebud in Montana will occur. Most of these projects have now been withdrawn or are in the process of being shut down.

The coal industry is changing rapidly and historic production is no longer a good predictor of future production. Business as usual is anything but for the coal industry, and the BLM must analyze the new-normal for the federal coal program and then analyze reasonable future development using more robust data and models.

¹⁶ Powder River Basin Coal Review, Q&A, http://www.blm.gov/wy/st/en/programs/energy/Coal_Resources/PRB_Coal/prbdocs/coalreview/QAs.html, last accessed, 7/15/2016.

¹⁷ AECOM, Task 2 Report for the Powder River Basin Coal Review—Past and Present and Reasonably Foreseeable Development Activities, December, 2011, http://www.blm.gov/wy/st/en/programs/energy/Coal_Resources/PRB_Coal/prbdocs/coalreview/task_2_update_12_0.html, last accessed 7/15/2016.

In developing national level RFD projections as part of the PEIS, the BLM must carefully consider assumptions that have been made in RFD analyses and whether they are valid. Given the economic conditions of the coal industry, existing mines may not remain in operation and new mines may not be built. Given the growth in natural gas generated electrical power and regulations such as the Clean Power Plan it might not be wise to assume that new coal-fired power plants will be built, or that existing coal-fired power plants will necessarily continue in operation. The RFD projections in the PEIS should be based on current conditions and those projected to be in place out to about 2050, which is the period of time that must be considered relative to this country's climate change GHG commitments. It is clear the level of federal coal development may well decrease, and the RFD in the PEIS should recognize this possibility and be based on it.

The Powder River Basin RFD Report, like other BLM RFDs, was considered part of a cumulative impacts analysis. Given the significance of the cumulative impacts analysis in the Coal PEIS, the BLM should similarly use an RFD analysis and projections to inform the needed cumulative impacts analysis in the PEIS.

We have also considered two other BLM RMP analyses where RFD for coal was implicated. First, in the Kemmerer RMP in Wyoming, the analysis was largely a technical, geological consideration of coal resources in the area with the coal development potential being considered. Additionally, the BLM applied the four RMP coal leasing screens that have been discussed elsewhere in these comments to identify areas that could be available for leasing. Six small areas were found to be acceptable for further consideration for leasing and one LBA area (the Haystack area) was of primary likelihood for development. In assessing the potential for future development the BLM considered coal sale prices that were evident in the area and EIA development forecasts, and generally concluded that the mine in the Kemmerer area would serve a local market (a local power plant) and that overall growth in the coal market in southwest Wyoming would be slow (0.8-0.9 percent per year).

In southwest Colorado, federal coal in the Paonia/Somerset area were the primary focus in the Uncompahgre Draft RMP. The RMP concluded mineable coal would be available in the area through at least 2022. In the planning area the Somerset coal field had the greatest potential for continuing production and demand for Somerset coal "will remain high and will likely continue to provide around 40 percent of Colorado's coal." The Elk Creek mine in Somerset has gone idle and is essentially closed. Reference is made in the Uncompahgre RMP to the "Coal Resource and Development Potential Report" but this document does not seem to be available on line.

To the extent existing RMPs have not provided RFD analyses for coal, the BLM will need to update those RMPs. It is apparent that the level of coal mining and the demand for coal may well decrease. The RFD in the Coal PEIS should be developed in light of this likelihood, using updated models and with related information provided by the EIA and the U.S. Geological Survey. BLM should develop a revised analysis of past and present coal development activities using updated data, assumptions, and analytical tools to reflect the "new normal" or baseline case

for the coal program. The agency should also develop an RFD for the program, incorporating into its analysis the use of energy models.¹⁸

Recommendations: The BLM should prepare an RFD as part of the Coal PEIS that incorporates sufficient analysis to inform cumulative impact analysis and management decisions. The RFD should follow the elements identified in BLM’s guidance for preparing an RFD for oil and gas development. Further, the RFD analysis in the Coal PEIS must not only provide information on the future coal development potential and the amount of coal that will be mined out to at least 2050, but should also look at estimates of the amount of land that will be disturbed by coal mining and the reclamation needs that will be presented by this level of disturbance. There is a need to know disturbance levels and reclamation needs as part of the RFD assessment. The BLM should also update RFDs in existing RMPs to the extent needed.

J. Maximum Economic Recovery Must Be Assessed in the Context of Multiple-Use Obligations.

There are requirements in the MLA and in BLM’s coal regulations for coal leasing and development to provide for the “maximum economic recovery” (MER) of the coal. However, MER does not dictate all decisions related to the federal coal leasing program. BLM retains significant discretion to decide if, when and where to issue leases, as well as how to regulate development of those leases and royalties or other associated fees.

There are only two points where applicable laws require DOI/BLM to apply the MER standard:

1. Before leasing, when deciding if a lease should be developed by surface or underground mining – using MER to determine the right technical approach. 30 U.S.C. § 201(a)(3)(C).
2. After leasing, when evaluating an operating plan, which must achieve MER in order to be approved. 30 U.S.C. § 201(a)(3)(C).

Further, operators have the responsibility to conduct operations to achieve MER, with the BLM confirming whether MER will be achieved. 43 C.F.R. § 3484.1(b). MER is defined in the BLM coal regulations but it “does not restrict the authority” of the BLM to make decisions providing for the conservation of other resources. *Id.* § 3480.0-5(21). In the definition of MER it is also stated that MER will also provide for “compliance with applicable laws and regulations.” *Id.* Prior to holding a lease sale, the Secretary must solicit public comments on the fair market value of the coal and its MER, and she must consider “factors that may affect these 2 determinations.” *Id.* § 3422.1(a).

While there are requirements to consider achieving MER when coal is leased, this should not be viewed as the sole goal of the federal coal program. Fundamentally coal leasing is a discretionary action on the part of the Secretary that is taken in the “public interests.” 30 U.S.C. § 201(a)(1). The Secretary can also attach terms and conditions of her choosing to a lease. *Id.* § 207(a). Before any actions can be taken on a leasehold that may cause significant disturbance to the

¹⁸ See Howard, Peter, “*The Bureau of Land Management’s Modeling Choice for the Federal Coal Programmatic Review,*” review copy, July 2016.

environment, lessees must submit for Secretarial approval an operations plan and a reclamation plan, and no bid for a lease can be accepted that is less than fair market value. *Id.* § 207(c). 43 C.F.R. § 3422.1(c). And most significantly, the FLPMA puts in place requirements for the BLM to ensure multiple-use management on the public lands, and one part of the definition of multiple-use provides for “consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output.” 43 U.S.C. § 1702(c). Moreover, numerous environmental protection provisions apply to federal coal leases such as the prohibition in FLPMA on taking any action that causes “unnecessary or undue degradation” of the land, and the numerous reclamation provisions of SMCRA and the provisions of the Clean Water Act and Clean Air Act.

Given these other multiple-use requirements, the BLM should not allow MER determinations to trump other important issues in deciding where, when, and how to lease. The MER requirements amended into the Mineral Leasing Act by the Federal Coal Leasing Act Amendments must be viewed as complimentary to the multiple-use requirements specified in FLPMA. The multiple-use definition in FLPMA clearly does not envision assuring MER unilaterally, rather, it envisions consideration of the relative values of the resources.

Recommendation: While the BLM is required to consider MER in the federal coal program, achieving MER should not be treated as a unilateral, unvarying command. It should be achieved in recognition and in compliance with the BLM’s broad multiple-use mission, which is also mandatory.

V. BLM MUST ENSURE THAT THE MITIGATION COMPONENTS OF THE PEIS ARE CONSISTENT WITH FLPMA, NEPA AND CURRENT MITIGATION GUIDANCE

As detailed more fully in Attachment 2, the agency has a broad range of authorities supporting analysis of the full range of impacts and actions to offset unavoidable impacts. FLPMA requires the BLM to manage for multiple use and sustained yield, and to avoid unnecessary or undue degradation of resources and values. *See*, 43 U.S.C. §§ 1701, 1732(b). NEPA and associated CEQ guidelines require the BLM to analyze potential impacts and consider ways to avoid, minimize and mitigate impacts. *See*, 40 C.F.R. §§ 1508.8, 1502.14, 1502.16. More recent guidance requires the BLM to take a landscape-scale approach to planning for conservation and energy development as well as analysis of proposed development and consideration of mitigation. This PEIS is the right vehicle for establishing a landscape-scale approach to coal leasing, exploration and development.

Applicable laws and policies require that the mitigation hierarchy be applied step-wise, starting with avoidance and then minimization, and only after opportunities for avoidance and minimization are exhausted considering compensatory mitigation to offset unavoidable impacts. The landscape-scale approach should also be used at all steps in the hierarchy; at the avoidance stage by focusing development in low-conflict areas and prioritizing conservation in areas with important and sensitive resources and values, at the minimization stage by developing protective measures that address resources on a landscape scale, and at the compensatory mitigation stage through development of Regional Mitigation Strategies or Plans.

Through its approach to mitigation in the Coal PEIS, BLM must ensure that impacts to *all* resources and values from coal leasing, exploration and development are addressed. Though there is a long history of requirements for compensatory mitigation for impacts to wetlands and endangered species, other resources and values have historically been neglected or ignored. Current mitigation guidance underscores the need to address all impacted resources and values, consistent with underlying statutes.

It is important to note that the improved approach to mitigation in recent guidance is not only required under current law and policy, it is also showing benefits in the form of improved outcomes for both energy developers and stakeholders and the public who care deeply about impacts on our public lands. The Dry Lake Solar Energy Zone outside of Las Vegas, Nevada shows the promise of this approach. Because of the landscape-scale approach and upfront analysis the BLM completed through the Solar PEIS and the Solar Regional Mitigation Strategy for the zone, the BLM was able to provide predictability to developers on their mitigation costs and an expectation for an efficient permitting process, drawing \$5.8 million in bids from three winning bidders. The BLM then completed NEPA analysis and permitting for the projects in less than a year, less than half the time for projects outside of zones. Mitigation funds will be spent on strategic restoration and preservation efforts in the region that have garnered the support of local and regional stakeholders. And First Solar will be delivering power from its projects in the zone for \$3.8 cents/kWh, one of the cheapest rates in the nation. Similar efficiencies and beneficial outcomes across interests could be achieved by using this smart approach in the coal program and PEIS as well.

The BLM must ensure that the mitigation components of the PEIS are consistent with all relevant laws and policies, including current mitigation guidance. Section IV includes the bulk of our recommendations on avoidance, the first and most important step in the mitigation hierarchy, and minimization, in recommending where, how and when to lease. This section is focused on compensatory mitigation for impacts to land, wildlife habitat, and other resources and values that are unavoidably impacted by coal leasing, exploration and development. Avoidance, minimization and compensatory mitigation for climate impacts from coal leasing, exploration and development are addressed in section VI.F.

A. BLM Must Ensure that the Mitigation Components of the PEIS Are Consistent with Current Mitigation Guidance, Including the Requirement for a Net Benefit or a Minimum of a No Net Loss Outcome.

Secretarial Order 3330, the report to the Secretary of Interior from the Energy and Climate Change Task Force, and the BLM's current mitigation guidance (IM No. 2013-142 and Draft Manual Section 1794), all direct the BLM to incorporate mitigation strategies into land use planning and programmatic evaluations such as this PEIS. BLM's final mitigation manual and handbook are forthcoming and will likely provide additional details and guidance, although we expect they will build on current requirements and our recommendations below will be consistent with the updated guidance.

More recent guidance in the form of the Presidential Memorandum: Mitigating Impacts on Natural Resources from Development and Encouraging Related Private Investment (2015) and the Department of the Interior’s Landscape-Scape Mitigation Manual (2015) also emphasize the importance of mitigation in BLM planning and decision-making. Key elements of these policies are summarized below and should be incorporated into BLM’s approach to mitigation in the PEIS:

- Landscape-scale approach: land use planning for conservation and energy development as well as analysis of proposed development and consideration of mitigation must use a landscape-scale approach to focus development in low-conflict areas and prioritize conservation in areas with important and sensitive resources and values.
- “Irreplaceable resources”: avoidance is the most appropriate tool for addressing “irreplaceable resources,” “resources recognized through existing legal authorities as requiring particular protection from impacts and that because of their high value or function and unique character, cannot be restored or replaced.”
- No net loss of important resources and values: mitigation must achieve a goal of no net loss of important resources and values, with a net benefit goal as required or appropriate.
- Climate change impacts and resilience: agencies must identify and promote mitigation measures that help address climate change impacts and resilience.
- Compensatory mitigation standards: compensatory mitigation (generally comprised of acquisition, restoration or preservation of resources and values) must be:
 - Durable: protected against non-conforming uses like development and lasting as long as the impacts;
 - Additional: demonstrably new conservation benefits that would not occur without mitigation;
 - Be developed based on the best available science: including for determining equivalency of impacts and mitigation benefits;
 - Provide for public transparency: including tracking locations of impacts and mitigation actions; and
 - Include monitoring and adaptive management.

Additional emphasis is appropriate for the no net loss/net benefit goal – the overarching goal of the mitigation approach in the PEIS should be to provide a net benefit for society as called for by the Presidential Memorandum. This would also be in accord with the MLA. *See* 30 U.S.C. § 201(a)(1) (providing that at the discretion of the Secretary of the Interior coal leasing tracts will be identified that provide for the “public interests”). If the net benefit goal or no net loss goal cannot be achieved for an area under consideration for leasing and development, it should not be considered for leasing and development.

We also recommend that the BLM emphasize the value of using preservation through special designations and conservation management as mitigation actions. Though compensatory mitigation has often focused on restoration, preservation is an incredibly important and valuable tool that can be used on its own or in concert with restoration. This is especially true for certain resources and values such as lands with wilderness characteristics that by definition are primarily intact and thus lend themselves to compensatory mitigation through preservation of other lands with equivalent values. The Solar PEIS explicitly provides for managing additional lands to

protect their wilderness characteristics as a form of compensating for unavoidable loss of lands with wilderness characteristics. *See*, Solar PEIS ROD, pp. 54-56. Further, recent Solar Regional Mitigation Strategies (SRMS) identify protective management as a form of compensatory mitigation and identify potential mitigation sites. *See, e.g.*, Colorado SRMS, Table 2-10, Figure 2-29; Arizona SRMS Table 2-5, Figure 2-12

Finally, we emphasize that the reclamation obligations imposed by the BLM and also fulfilled through the bonds held by the OSMRE or authorized states do not relieve the agency of its mitigation obligations. The bonds can assist in ensuring impacts are addressed, but this is not a substitute for avoiding impacts altogether or minimizing impacts through measures such as limiting surface disturbance and designing facilities to minimize destruction or interference with wildlife habitat and wildlife, The BLM has authority to incorporate mitigation requirements into special stipulations and mine plans, guided by standards set at the planning level, which will also set standards that the OSMRE or authorized states will follow in requiring and managing reclamation.

B. BLM should develop Regional Mitigation Strategies or Plans to Support the PEIS.

BLM's current mitigation policy under IM No. 2013-142 and Draft Manual Section 1794 (DM 1794) provides guidance on establishing both Regional Mitigation Strategies and Plans. For Regional Mitigation Strategies, it provides policies, procedures and instructions for "Developing strategies that identify and facilitate mitigation opportunities at the regional scale, including mitigation opportunities on both BLM-managed public lands and non-BLM-managed lands (other Federal lands, as well as Tribal, State, and private lands);" DM 1794 p. 1-1. For Regional Mitigation Plans, it provides policies, procedures and instructions for "Using the land use planning process to identify potential mitigation sites and measures (e.g., land treatments, infrastructure modification or removal) on BLM-managed lands at a regional level (including by considering and potentially incorporating any Regional Mitigation Strategies)." *Id.*

The policy goes on to provide additional details on what components these strategies and plans should include and how they should be developed. The BLM has already completed several Solar Regional Mitigation Strategies, including for the Dry Lake Solar Energy Zone described above. BLM is also developing a Regional Mitigation Strategy for oil and gas development in the National Petroleum Reserve-Alaska, and will be developing regional mitigation strategies for greater sage-grouse as well. These mitigation strategies also incorporate elements identified as part of regional mitigation plans, although they are not being prepared with NEPA analysis.

The BLM can and should develop an overarching mitigation strategy for the Coal PEIS. Further, to the extent that the BLM identifies priority areas or zones for coal leasing as part of this PEIS and amends underlying RMPs, BLM should include in the PEIS Regional Mitigation Plans for those priority areas or zones and incorporate the Plans into the underlying RMPs through the PEIS. The PEIS should also commit to development of Regional Mitigation Plans or Strategies to support future priority areas or zones that may be designated through future land use planning.

Further, as noted above, BLM has identified mitigation sites and potential actions in the SRMS it has prepared. In addition to identifying these sites, the BLM can ensure that the potential for

mitigation actions to be conducted in these sites, including preservation, is safeguarded through interim management direction. The BLM can identify these “pools” for mitigation actions in Regional Mitigation Strategies or Regional Mitigation Plans and also direct that they be protected from actions that could harm their potential function.

Though both Regional Mitigation Strategies and Plans are very valuable, BLM should pursue opportunities to complete the NEPA analysis necessary to select mitigation sites and approve mitigation actions through development of Regional Mitigation Plans whenever possible. Doing so also provides the opportunity to add durability and additionality to mitigation sites through special designations or management decisions (e.g. managing lands with wilderness characteristics for protection). Such special designations or management decisions will also help ensure that the viability of the mitigation sites is maintained between the finalization of the Regional Mitigation Plan and leasing, exploration, and development of priority areas or zones. Incorporating Regional Mitigation Plans into the underlying RMP will greatly increase the value of the Plans in providing a predictable and efficient process and maximally beneficial outcomes for compensatory mitigation. It is also consistent with BLM’s emphasis on landscape-level planning found in Planning 2.0. We note that even if a Regional Mitigation Strategy is developed instead of a Plan, the additional benefits described above can be achieved by incorporating the Strategy into the underlying RMP. However, the BLM should use the opportunity that this PEIS provides to start out with Regional Mitigation Plans that are incorporated into the underlying RMPs through the PEIS as much as possible.

Recommendations: The BLM must ensure that the mitigation components of the PEIS are consistent with all relevant laws and policies, including current mitigation guidance. This includes the use of a landscape-scale approach, an emphasis on a net benefit outcome, the importance of preservation as a mitigation action, and the use of Regional Mitigation Strategies and Plans to support the PEIS. A Regional Mitigation Strategy for the Coal PEIS would set an important framework to guide additional Regional Mitigation Strategies and Regional Mitigation Plans. Mitigation should be analyzed at both the land use planning stage and at the regional coal leasing stage via NEPA-based EISs that adopt the required mitigation policies. The mitigation policy should be made applicable to existing mines and areas in the vicinity of existing mines that are proposed for mining, as well as to new areas that might be open for mining consideration.

VI. THE PEIS MUST ADDRESS CLIMATE CHANGE IMPACTS RELATED TO THE FEDERAL COAL PROGRAM, INCLUDING RELATED MITIGATION.

A. Introduction

The need to address climate change impacts in the Coal PEIS has been raised above; in this Section we will address this issue in more detail. We also note that while the PEIS is fundamentally directed at the coal leasing and development program, our concerns about climate change relate to all fossil fuels that are produced from the federal mineral estate—oil, natural gas, and coal, as well as oil shale and tar sands. Thus, this Section of our comments applies to climate change issues that are created from fossil fuel extraction on the federal mineral estate, not just coal production. While the immediate opportunity—and indeed the carbon necessity—

starts with the climate change impacts of coal, the analysis should not end there and oil, natural gas, oil shale and tar sands should also be included in a Department-wide analysis as soon as possible. Both the emissions causing climate change and the unavoidable impact of climate change, including social costs and changes to landscapes, need to be addressed.

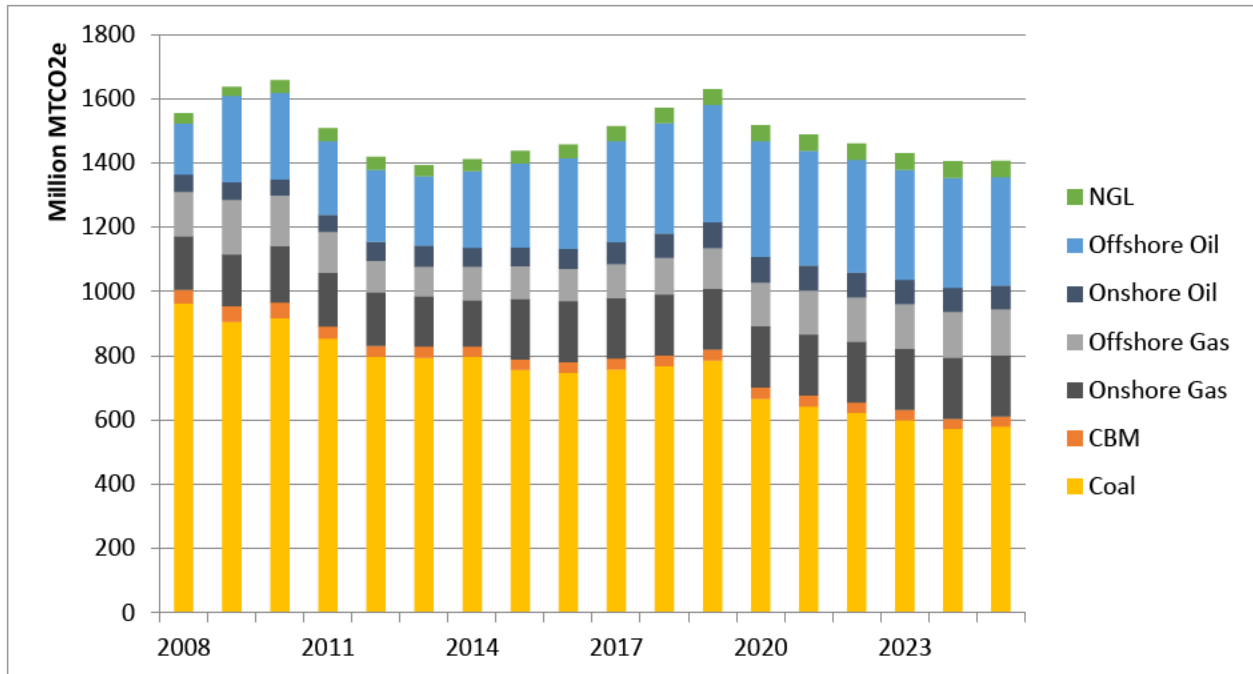
Fossil fuels production on federal public lands and mineral estate is extensive and the production of greenhouse gasses (GHG) resulting from the exploration, extraction, transportation and combustion of these fuels is significant. The climate change impacts we are seeing from GHG emissions are already evident and will worsen unless emissions of GHG are greatly reduced. The wide range of impacts from climate change, including melting glaciers and earlier snow melts in our mountains that disrupt water supplies in the west, forest fires, widespread drought, rising sea levels, and the spread of invasive species, have been rigorously and scientifically documented by the Intergovernmental Panel on Climate Change, as well as American researchers and agencies. These have led to substantial commitments made by this Administration to reduce our national contribution to climate change. As part of these commitments, federal agencies are required to take climate change impacts into account in decision-making.

Our public lands and minerals are held in trust for the public. We must ensure this trust is not broken when fossil fuels are leased and developed on these lands. The federal fossil fuels program, including the coal program, must provide assurance the public trust will not be violated by carefully considering climate change issues and taking steps to avoid, minimize and offset impacts through compensatory mitigation.

In 2012 as much as 21 percent of the Nation's GHG emissions originated from coal, oil and natural gas extracted from the public lands, with coal contributing over 57 percent of this. Federally produced coal is contributing roughly 10 percent to U.S. GHG emissions.¹⁹

Table 5. TWS Analysis of Lifecycle Emission from Federal Lands by Fuel Type

¹⁹ Claire Moser, Joshua Mantell, Nidhi Thakar, Chase Huntley and Matt Lee-Ashley. *Cutting Greenhouse Gas from Fossil-Fuel Extraction on Federal Lands and Waters*. March 19, 2015. Policy brief and underlying analysis is available at <http://wilderness.org/blog/blind-spot-plan-reduce-emissions-slowing-progress-fight-against-climate-change> (accessed July 28, 2016).



There are three critical needs relative to BLM decision-making and climate change, including for the federal coal program. First, the agency must provide an accurate and comprehensive assessment of the *amount* of GHG produced by its fossil fuel program activities. Second, it must ensure a fair and comprehensive assessment of the *impacts* of these GHG emissions. It is critical that two GHG in particular receive treatment in these analyses: carbon dioxide (CO₂) and methane (CH₄), both of which are emitted at significant levels as a result of the federal coal leasing and development program. Third, it must commit to avoiding, minimizing and offsetting impacts through compensatory mitigation.

B. The BLM is Obligated to Measure and Disclose to the Public Reasonably Foreseeable Climate Change Emissions and Associated Impacts from the Federal Coal Program.

1. Guidance from the President, Department of the Interior and CEO.

S.O. 3289 unequivocally mandates all agencies within the Department of the Interior “analyze potential climate change impacts when undertaking long-range planning exercises, setting priorities for scientific research and investigations, developing multi-year management plans, and making major decisions regarding potential use of resources under the Department’s purview.” S.O. 3289 (Addressing the Impacts of Climate Change on America’s Water, Land, and Other Natural and Cultural Resources), *incorporating* S.O. 3226 (Evaluating Climate Change Impacts in Management Planning). Activities such as the PEIS must meet these requirements. Notably, S.O. 3338, in directing preparation of the PEIS, cites the need to address climate change as one of the main purposes for this evaluation of the coal program.

Making the case for the need to consider climate change in NEPA documents, the Council on Environmental Quality (CEQ) issued its revised draft Climate Change NEPA Guidance in December, 2014.²⁰ It provides direction to all agencies on when and how to consider the effects of GHG emissions and climate change in the evaluation of federal actions. The guidance states that, “[i]t is essential . . . that federal agencies not rely on boilerplate text to avoid meaningful analysis, including consideration of alternatives or mitigation.” The CEQ draft guidance provides detailed reasons and instruction on how climate change and GHG NEPA analyses can be effectively accomplished. Any “boilerplate” claims that GHG and climate change analyses are impossible are rejected.

The Department of the Interior’s Departmental Manual on Mitigation clearly states in its principles for implementing mitigation that it will “Identify and promote mitigation measures that help address the effects of climate change and improve the resilience of our Nation’s resources and their values, services, and functions.” Manual Section 6.6.F on p. 6. It goes on to say that this includes “Considering greenhouse gas emission in project design, analysis, and development of alternatives.” Manual Section 6.6.F.(6) on p. 7. Though our recommendations on avoiding, minimizing and mitigating impacts from GHG emissions from the federal coal program are discussed in further detail in Section VI.F, we include these citations here because they underscore the fact that the BLM must have an accounting for the amount of GHG emissions and climate change impacts from its coal program in order to mitigate for those impacts.

S.O. 3330 (Improving Mitigation Policies and Practices of the Department of the Interior) as well as the report to the Secretary of the Interior from the Energy and Climate Change Task Force,²¹ and the BLM’s current mitigation guidance (IM No. 2013-142 and Draft Manual Section 1794), all also direct the BLM to incorporate mitigation strategies into planning and to address climate change. S.O. 3330 notes that a key reason for issuing the new policy is to “focus on mitigation efforts that improve the resilience of our Nation’s resources in the face of climate change.” More recent guidance in the form of the Presidential Memorandum: Mitigating Impacts on Natural Resources from Development and Encouraging Related Private Investment (2015) and the Department of the Interior’s Landscape-Scape Mitigation Manual (2015) also emphasize the importance of mitigation in BLM planning and decision-making and how it can and should apply in the context of addressing impacts from climate change. Again, the BLM must have an accounting for the amount of GHG emissions and climate change impacts from its coal program in order to mitigate for those impacts.

²⁰ Available at <https://www.whitehouse.gov/administration/eop/ceq/initiatives/nepa/ghg-guidance>.

²¹ Clement, J.P. et al. 2014. *A strategy for improving the mitigation policies and practices of the Department of the Interior*. A report to the Secretary of the Interior from the Energy and Climate Change Task Force, Washington, D.C.

2. Applicable requirements of NEPA.

NEPA requires all significant environmental impacts to be considered in an EIS. The “twin aims” of NEPA are to “consider every significant aspect of the environmental impact of a proposed action” and to “ensure that the agency will inform the public that it has indeed considered environmental concerns in its decisionmaking process.” *Baltimore Gas & Elec. Co. v. Natural Res. Def. Council*, 462 U.S. 87, 97 (1983). BLM must fully analyze the cumulative and incremental impacts of proposed decisions, including climate change impacts. *Center for Biological Diversity v. Nat’l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008). In that case, the NHTSA failed to provide analysis for the impact of greenhouse gas emissions on climate change and was rebuked by the U.S. Court of Appeals for the Ninth Circuit, which observed that, “[t]he impact of greenhouse gas emissions on climate change is precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct.” 538 F.3d at 1217.

Further, NEPA regulations require that NEPA documents address not only the direct effects of federal proposals, but also “reasonably foreseeable” indirect effects. These are defined as:

Indirect effects, which are caused by the action and are later in time or farther removed in distance, *but are still reasonably foreseeable*. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.” 40 C.F.R. § 1508.8(b) (emphasis added).

That said, the law is well settled that NEPA only establishes procedural requirements for agencies to follow, it does not establish substantive environmental protection mandates. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989). Nevertheless, NEPA is intended to be “action-forcing” so as to achieve its environmental protection policies, and consideration of mitigation is an important element of that. *Id.* at 350, 351; *see also* 40 C.F.R. § 1502.1 (stating the primary purpose of an EIS is to be “action-forcing” so as to ensure the policies and goals of NEPA are infused into agency decision-making). Therefore, as detailed in Section V.F., an important element of the coal program PEIS will be consideration of climate change mitigation options, and under the climate change commitments this country has made (discussed below), development of mitigation measures will be required.

3. National commitments to reduce greenhouse gas emissions.

The context for these requirements, as noted above, is the important commitments made by this Administration regarding climate change. One of these commitments is a GHG reduction strategy. The United States has submitted its target to cut net GHG emissions to the United Nations Framework Convention on Climate Change. This Intended Nationally Determined Contribution (INDC), as provided for in the Paris Agreement, is a formal statement of the U.S. target to reduce emissions by 26 to 28 percent below 2005 levels by 2025. In addition, to achieve a no more than 2 degrees C temperature increase, heat trapping gasses in the atmosphere must be kept at or below 450 parts per million CO₂-eq., which means that industrialized nations like the U.S. will have to reduce their emissions an average of 70 to 80 percent below 2000 levels by

2050. This will require that a carbon budget be developed that limits carbon emissions from federal energy development in order to keep emissions below 500m metric tons CO₂-eq by 2050. The need for a coal program budget will be discussed in detail in Section VI.E.

In addition, on June 29, 2016, the leaders of Canada, Mexico, and the United States committed to the North American Climate, Clean Energy, and Environment Partnership. Under this agreement the countries will pursue an historic goal for North America to strive to achieve 50 percent clean power generation by 2025. “Canada, the U.S., and Mexico will work together to implement the historic Paris Agreement, supporting our goal to limit temperature rise this century to well below 2 degrees C, and pursuing efforts to limit the temperature increase to 1.5 degrees C.”²²

These commitments are consistent with and required by The President’s Climate Action Plan (June 2013) which calls for many steps to combat climate change such as reductions in CO₂ emissions from power plants, increased use of renewable energy, improved automobile efficiency standards, and reducing methane emissions, among many other things.²³ But to achieve the goals of the Climate Action Plan, which include “steady, responsible action to cut carbon pollution, [so] we can protect our children’s health and begin to slow the effects of climate change so that we leave behind a cleaner, more stable environment,” it will also be necessary to address issues related to fossil fuel extraction from our public lands. The Coal PEIS and other BLM regulatory actions should look to these commitments as part of decision-making, in order to ensure that steps are taken to meet these commitments.

4. Court cases requiring analysis of GHG emissions.

In the context of the federal coal program, there have been an increasing number of court decisions requiring federal agencies to present an analysis of GHG emissions in their coal program NEPA analyses, including downstream emissions. The indirect effects—such as burning the coal to generate electricity and thereby producing GHG—must be considered. Four cases where the agency did not take the required NEPA “hard look” at downstream emissions of the combustion of coal included:

- *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F. Supp. 3d 1174 (D. Colo. 2014).
- *Dine Citizens Against Ruining our Env’t v. Office of Surface Mining Reclamation and Enforcement [OSMRE]*, 82 F. Supp. 3d 1201 (D. Colo. 2015).
- *Wild Earth Guardians v. OSMRE*, 104 F. Supp. 3d 1208 (D. Colo. 2015).
- *Wild Earth Guardians v. OSMRE*, No. CV 14-103-BLG-SPW (D. Mt., Oct. 32, 2015, Jan 21, 2016).

²² See <https://www.whitehouse.gov/the-press-office/2016/06/29/leaders-statement-north-american-climate-clean-energy-and-environment> (presenting Leaders’ Statement on a North American Climate, Clean Energy, and Environment Partnership).

²³ See also Climate Action Plan Strategy to Reduce Methane Emissions (March 2014) (presenting the President’s methane reduction strategy).

As a result, the agencies' NEPA analyses were invalidated and the agencies have been forced to conduct additional analyses. In another case the court held that the analysis of downstream emissions was adequate party because emissions from coal combustion had already been disclosed. *Wild Earth Guardians v. OSMRE*, 120 F.Supp.3d 1237 (D. Wyo. 2015).

The BLM should clearly present information on the amount of GHG that are produced by the federal coal program, both upstream and downstream, in the PEIS. This would be consistent with the requirements of S.O. 3338 and the BLM's statements in the Federal Register notice announcing the PEIS.

5. Reliable methods and tools exist to measure and disclose the amount of greenhouse gas emissions from federal coal.

On the same day Secretary Jewell issued S.O. 3338, she also issued several good governance policies designed to improve the effectiveness of permitting, including directing the Interior Department's U.S. Geological Survey to establish and maintain a public database to account for the annual carbon emissions from fossil fuels developed on federal lands and waters. The agency has estimated a delivery date of 2018 for that tool.²⁴ In the interim, there are a number of well-recognized methods available for assessing the amount of CO₂-eq and methane emissions that result from federal fossil fuels leasing and development. These include downstream amounts, such as those resulting from the combustion of coal primarily for electricity generation. These methods can be used in the PEIS to estimate GHG emissions resulting from the federal coal program. Methods such as the Greenhouse Gas Protocol and the EPA's GHG Reporting Rule can provide estimates of the GHG emissions levels from federal fossil fuel programs, including the coal program. The PEIS should employ these methods.

Recommendations: The BLM is clearly required to measure, evaluate and fully consider the GHG emissions and climate change impacts of the federal coal program in the PEIS based on a number of policies of the BLM and other agencies, and even the President. NEPA also requires the BLM to fully consider climate change issues in the PEIS. This must include both upstream and downstream emissions, including those from coal combustion at power plants. This analysis must inform BLM's requirements to avoid, minimize and compensate for these impacts consistent with this country's climate change commitments, specifically the requirement to reduce emissions by 26 to 28 percent below 2005 levels by 2025. This analysis and decision-making should seek to achieve a no more than 2 degrees C temperature increase, which will require the U.S. to reduce emissions an average of 70 to 80 percent below 2000 levels by 2050. The PEIS should put in place requirements to achieve these commitments.

C. The BLM Must Disclose Climate Change Impacts in its NEPA Analyses.

In addition to disclosing the *amounts* of GHG emitted as a result of its coal program, and other programs, the BLM must also disclose the *impacts* of those emissions in its NEPA analyses. NEPA specifically requires federal agencies to analyze and disclose the environmental effects of

²⁴ See Q&A Department of the Interior Federal Coal Reforms, available at http://www.blm.gov/style/medialib/blm/wo/Communications_Directorate/public_affairs/news_release_attachments.Par.98291.File.dat/Questions%20and%20Answers%20Coal.pdf.

their actions. 40 C.F.R. § 1508.8. Where “information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known,” NEPA regulations direct agencies to evaluate a project’s impacts “based upon theoretical approaches or research methods generally accepted in the scientific community.” 40 C.F.R. § 1502.22(b)(4).

A number of tools exist that BLM could use to conduct an evaluation of climate change impacts. Some of these tools are more developed than others and some may be finalized while the PEIS is proceeding. BLM should ensure that any and all tools used can meaningfully quantify impacts of GHG emissions.

1. BLM should use one or more generally-accepted approaches to assess climate impacts.

The BLM must employ one or more accepted approaches to assess climate impacts associated with potential future leasing, and require those approaches be used in future significant leasing decisions. Any such method should be based on the best available science and be generally accepted as rigorous and transparent.

The Social Cost of Carbon (SCC) is a leading tool for quantifying the climate impacts of proposed federal actions. The SCC is an estimate, in dollars, of the long term damage caused by a one ton increase in carbon dioxide (CO₂) emissions in a given year; or viewed another way, the benefits of reducing CO₂ emissions by that amount in a given year. The SCC is intended to be a comprehensive estimate of climate change damages that includes, among other costs, the changes in net agricultural productivity, risks to human health, and property damages from increased flood risks. The method was initially designed for application in rulemakings, but the courts have recognized its applicability to NEPA analyses.²⁵

The SCC was developed through a rigorous multi-agency process based on generally accepted research methods and years of peer-reviewed scientific and economic studies. In 2010, an interagency working group was convened by the Council of Economic Advisers and the Office of Management and Budget to design an SCC modeling exercise and develop estimates for use in rulemakings. The interagency group was comprised of scientific and economic experts from the White House and federal agencies, including: Council on Environmental Quality, National Economic Council, Office of Energy and Climate Change, and Office of Science and Technology Policy, EPA, and the Departments of Agriculture, Commerce, Energy, Transportation, and Treasury. The interagency group identified a variety of assumptions, which EPA then used to estimate the SCC using three integrated assessment models, which each combine climate processes, economic growth, and interactions between the two in a single modeling framework.

This method has undergone careful peer review from a number of agencies and has been subject to updates and revisions, and considerable public comment. For example, see the Office of Management and Budget's (OMB) SCC site, which presents the OMB response to the public comments received through its solicitation for comments on use of SCC estimates in Federal

²⁵ See *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F. Supp. 3d 1174 (D. Colo. 2014).

regulatory analyses.²⁶ In this response, OMB announced plans to obtain expert, independent advice from the National Academies of Sciences, Engineering, and Medicine on how to approach future updates to the estimates. This panel is concluding its review but published an interim review generally reaffirming the methods used to develop the SCC for use in evaluating proposed federal actions.²⁷

In addition, the Environmental Protection Agency (EPA) has developed a companion protocol called the Social Cost of Methane method, focusing on methane emissions. These methods provide a way to quantify the costs of GHG emissions and present them to the public. Since the benefits of the production of fossil fuel production are regularly monetized in BLM's NEPA documents, it is critical that the *impacts* also be monetized.

The SCC protocol is relatively simple, involving the following steps: (1) identify the amount of coal produced, (2) estimate the tons of CO₂ generated from the exploration, extraction, processing, transport and combustion of this coal, (3) multiply the amount of CO₂ produced times a factor provided from the appropriate discount rate from the SCC tables, and (4) get a total SCC by adding the amounts for each year that coal mining would occur. To achieve an accurate assessment of the impacts of GHG emissions, some experts have said lower discount rates (3 percent or lower) should be applied in the SCC model.

There is at least one court case supporting the use of the SCC protocol. In *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F. Supp. 3d 1174 (D. Colo. 2014), a case involving coal mining EISs, the court rejected claims that it was too speculative to estimate coal combustion emissions when the SCC method was available to the agency and had been recognized earlier by the agency. This was particularly true because the agency presented the *benefits* of the project in a monetary form. By refusing to quantify the climate change costs of the project, the agency effectively zeroed out the costs of greenhouse gasses. Presenting only a project's economic upsides while omitting a projection of the project's costs was arbitrary and capricious and violated NEPA.

However, the SCC has some limitations. The method is recognized as an underestimate of the total likely damages associated with a proposed action.²⁸

Nevertheless, CEQ recognized in its Draft Guidance that the SCC “offers a harmonized interagency metric” that can provide context for a meaningful NEPA review. Thus, as the leading tool to quantify economic damage likely from a proposed action, the SCC and the EPA

²⁶ See <https://www.whitehouse.gov/omb/oira/social-cost-of-carbon>. (Accessed July 25, 2016.)

²⁷ National Academies of Sciences, Engineering, and Medicine. (2016). *Assessment of Approaches to Updating the Social Cost of Carbon: Phase 1 Report on a Near-Term Update*. Committee on Assessing Approaches to Updating the Social Cost of Carbon, Board on Environmental Change and Society. Washington, DC: The National Academies Press.

²⁸ EPA concluded, “The models used to develop SC-CO₂ estimates, known as integrated assessment models, do not currently include all of the important physical, ecological, and economic impacts of climate change recognized in the climate change literature because of a lack of precise information on the nature of damages and because the science incorporated into these models naturally lags behind the most recent research. **Nonetheless, the SC-CO₂ is a useful measure to assess the benefits of CO₂ reductions.**”

<https://www3.epa.gov/climatechange/EPAactivities/economics/scc.html> (emphasis added). Accessed July 25, 2016.

SCM clearly can assist in quantifying the costs associated with GHG emissions, that is, the impacts of climate change. At a minimum, we therefore believe these tools should be applied in the Coal PEIS.

Additional means to assess the impacts of carbon dioxide and methane emissions should also be pursued. These additional approaches should, at a minimum, be consistent with existing guidance including the BLM's guidance on estimating non-market environmental values (Instruction Memorandum No. 2013-131 Change 1) and the CEQ Draft Guidance.

One alternative method identified by the National Academies of Science is an iterative risk management assessment. In a risk management assessment the BLM would consider means to reduce or respond to GHG emissions such as through mitigation, adaptation, geo-engineering, or an improved knowledge base. Many responses are possible for estimating risk reduction potential. Such a method should seek to pursue the most feasible options, pursue options with the lowest costs and good cost effectiveness, put in place options with proven effectiveness, ensure equity and fairness, and be robust to the uncertainties surrounding climate change. The approximate costs would then serve as the basis for determining the risk cost of a proposed action.²⁹

2. Climate change impacts should be analyzed from a global perspective.

It is also critical that the BLM assess climate change impacts from a global perspective, not just a local or even national perspective. The PEIS is national in scope—this is a perfect time to look at the overall impacts of GHG emissions and not claim individual impacts are too small.

Addressing impacts globally is part of a strategy to encourage other nations to take steps to address climate change that will directly benefit Americans. Moreover, issues such as climate change and clean air are globally common resources available to all, but any one country's degradation or harm to these resources impacts the whole world. Carbon pollution is not limited to the area where it is released, but rather it mixes and travels freely throughout the world and affects the climate worldwide. The carbon and methane pollution in this country not only impacts the U.S., it also imposes externalities on the rest of the world. And when other countries take steps to reduce their climate change emissions, it also benefits the U.S. If we only set our GHG emission strategies based on domestic costs and benefits while ignoring global consequences there would be a significant reduction in climate protection benefits and significantly increased risks of harms, including to the United States.

As stated in CEQ's Draft Guidance, "the statement that emissions from a government action or approval represent only a small fraction of global emissions is more a statement about the nature of the climate change challenge, and is not an appropriate basis for deciding whether to consider climate impacts under NEPA This approach does not reveal anything beyond the nature of the climate change challenge itself: the fact that diverse individual sources of emissions each make relatively small additions to global atmospheric GHG concentrations that collectively have huge impact." There is little doubt that the consideration of indirect impacts that is required

²⁹ See *America's Climate Choices*, National Academy of Sciences, National Research Council at 46-50 (presenting and discussing these issues).

under the CEQ NEPA regulations includes consideration of different scales of impacts. 40 C.F.R. § 1508.8(b). Therefore, the assessment of climate change impacts in the PEIS should clearly be on a global scale.

3. BLM should not assume perfect substitution in analyzing GHG impacts.

Related to the issue of ensuring there is a global and life-cycle analysis of GHG impacts on climate change is the question of “perfect substitution” by other coal from other sources for federal coal that is not mined. Some claim that “perfect substitution” will occur if there is less federal coal mined, and therefore any climate change and other benefits of the reduction in federal coal supply will be nullified. This argument has no basis. Much (85 percent) of the federal coal is mined in the Powder River Basin in Wyoming and Montana. This coal is notable for being low cost and having low sulfur content relative to other sources of coal in the U.S. What this means is that if Powder River Basin coal is not produced, the costs of other coal will make these sources less economically attractive than the Powder River Basin coal. In addition, it will not have the low sulfur (reduced air pollution) benefits of the Powder River Basin coal. That is, there will not be a basis for “perfect substitution.”

Moreover, given the higher prices and higher sulfur content of alternative sources of coal and the availability of renewable forms of energy with no (or very little) GHG emissions and increased energy efficiency measures, there will likely be “fuel switching” market decisions made by companies. Companies will choose to switch from coal to renewable forms of energy, or natural gas, in many cases, which will reduce climate change impacts.

Perfect substitution of other coal for federal coal that is not mined is an unfounded myth and should not be used to avoid evaluating climate change impacts in the PEIS. This theory is not based on empirical evidence and it is not supported by economic theory. In addition, there have been several recent papers that bring into question the perfect substitution theory by the White House Council of Economic Advisors, Vulcan Philanthropy, Stockholm Environment Institute, and the Carbon Tracker Initiative.³⁰

The substitution question has been addressed relative to the federal offshore oil and natural gas leasing program where one court noted that fuel switching would lead to greater conservation: “forgoing additional leasing on the [outer continental shelf] would cause an increase in the use of substitute fuels . . . and a reduction in overall domestic energy consumption from greater efforts to conserve in the face of higher prices.” *Ctr. for Sustainable Economy v. Jewell*, 779 F.3d 588, 609 (D.C. Cir. 2015).

³⁰ CEA. 2016. “The Economics of Coal Leasing on Federal Lands: Ensuring a Fair Return to Taxpayers”. Council of Economic Advisers. May 2016.

Vulcan/ICF. 2016. “Federal Coal Leasing Reform Options: Effects on CO2 Emissions and Energy Markets. Final Report: Summary of Modeling Results.” A Vulcan Philanthropy | Vulcan, Inc. report with analysis supported by ICF International, Fairfax, VA. February 2016.

Erickson, Peter and Lazarus, Michael. “How would phasing out U.S. federal leases for fossil fuel extraction affect CO2 emissions and 2°C goals?” Stockholm Environment Institute, Working Paper 2016-02. May 2016.

Fulton, Mark; Kaplow, Doug; Capalino, Reid; and Grant, Andrew. “Enough Already: Meeting 2°C PRB Coal Demand Without Lifting the Federal Moratorium.” July 2016.

4. Local impacts must also be considered.

While the BLM must ensure there is a global analysis of climate change impacts in the PEIS, and impacts due to other fossil fuels decisions, it also cannot exclude local climate change and other local environmental impacts. The BLM often expresses the monetary benefits of the coal program on a local level—county employment benefits, county tax benefits, etc. The SCC is well adapted to assessing impacts on a broad, global, level but may not be as well suited to a consideration of local monetary impacts. The BLM should ensure that there is also a local consideration of the costs of the coal program in the PEIS—both relative to climate impacts and of other environmental and social impacts. The local benefits of “fuel switching” to things like greater reliance on development of renewable sources of energy in local areas should be fully considered in the PEIS.

In addition, BLM should take a hard look at the short- and long-term impacts of each alternative on carbon storage. BLM lands can be an important carbon “sink” that functions to store carbon and keep it out of the atmosphere. BLM has a duty under FLPMA to prepare a current and up-to-date inventory of public lands and their new and emerging resource values. 43 USC § 1711. This more local issue should also be considered the PEIS.

Recommendations: The second critical step in analyzing climate change issues in the PEIS after determining the amount of GHG that are emitted is to evaluate the climate change impacts of those emissions. This can be done by utilizing the Social Cost of Carbon (and companion EPA Social Cost of Methane) protocol. The BLM should use this method for climate change impact assessment in the PEIS. But in addition, due to some shortcomings in the SCC method, the BLM must also evaluate qualitative, non-monetary impacts that are caused by climate change, such as from earlier snowmelts in our western mountains that are changing water supplies. This analysis should be done from a global perspective because as recognized in the CEQ Climate Change NEPA Guidance, “diverse individual sources of emissions each make relatively small additions to global atmospheric GHG concentrations that collectively have huge impact.” That said, local impacts also need to be considered especially since the BLM has traditionally published the local monetary benefits of the coal program in its NEPA analyses. BLM should not assume that federal coal that is not produced will simply be replaced by production from other sources (so-called “perfect substitution”) thus eliminating any climate change benefits —this unfounded myth is not based on empirical evidence or sound economic theory, and it has been rejected in several reports.

D. The BLM Should Establish Carbon Emission Targets for Future Coal Leasing Based on U.S. Climate Commitments and Expected Future Leasing and Production Scenarios (a so-called “Carbon Budget”).

1. Introduction.

Secretarial Order 3338 clearly states that concerns regarding whether the federal coal program was in conflict with the nation’s climate policies and climate goals was one of the three most

significant issues that were identified.³¹ Similarly, the Notice of Intent clearly stated that the public concern raised during listening sessions in 2015 led to the agency’s consideration of these questions: “Many stakeholders highlighted the tension between producing very large quantities of Federal coal while pursuing policies to reduce U.S. GHG emissions substantially, including from coal combustion.” NOI, p. 21. As recognized in the S.O. federal coal production represents approximately 41 percent of the total coal produced in the U.S. and when combusted, contributes about 10 percent to total U.S. GHG emissions. Accordingly, the NOI instructed that the PEIS should assess the climate impacts of the federal coal program, including coal combustion, and how those impacts should be addressed in coal program management, including “how best to ensure no undue or unnecessary degradation of public lands from climate change impacts.” NOI, p. 21

In that vein, a critical element of the S.O. is increasing the transparency of energy leasing and production activities on public lands. We believe reforms to the manner and terms of leasing are essential. But without a commitment to ensuring that the Department of the Interior (as the nation’s largest energy asset manager) measures and discloses to the American public the carbon performance of current and expected future energy leasing and production, comprehensive reform will fall short of the Department’s intended goals.

2. Definition of a “carbon budget.”

A “carbon budget” is often defined as the quantity of carbon dioxide that the nations of the world can emit and still limit warming to 2-degree C above pre-industrial levels, although recently it has been applied to determine quantities of fossil energy that could be burned by individual nations consistent with their commitments.

While there appears to be general agreement on the conceptual definition of “carbon budget,” the operational use of the term varies widely. It has been in use in the forestry and agricultural sector for years in the sense of bookkeeping for stocks and flows due to annual variation, including harvest and natural or man-made perturbations like wildfire, whereas the term has been used as short-hand for a fixed cap on emissions across the full carbon cycle in some climate policy circles.

In the context of these comments, **we use the term “carbon budget” to refer to the estimated annual volumes of CO2 advisable from federal lands under international goals set by leading climate science and prevailing national climate emissions reduction commitments.** To us, these volumes function best as performance targets set as a matter of policy rather than as a hard and fast cap. We believe BLM can create a “carbon budget” to establish a CO2 emission reduction target that takes into consideration our domestic and international climate commitments and can be used as a policy and decision-making tool when addressing the questions of when and how much fossil fuel development should be permitted on federal land.

³¹ The Order clearly notes the tension between international emissions reduction pledges and the carbon emissions resulting from federal coal. See SO 3338, p 4.

3. Support for conceptual framework for a “carbon budget.”

The concept of a carbon budget builds upon the well-established scientific understanding that the global increase in temperature due to greenhouse gas emissions must be capped at or below 2-degree C to avoid unmanageable climate change consequences. The 2-degree C threshold was first enshrined in the 2009 Copenhagen Accord³² and reaffirmed in the 2015 Paris Agreement as the limit for “acceptable” warming.³³

During that time, the international scientific community’s understanding of the interaction between fossil fuel development and temperature thresholds has greatly increased, and today it is widely agreed that development of additional reserves should be considered in the context of warming goals—giving rise to the idea of a carbon budget for the planet. In fact, this notion has been assessed and supported by the IPCC in all assessment reports going back to 1990 and has yielded a methodology routinely employed and updated annually by the Global Carbon Project.³⁴

The IPCC’s analytic method was further advanced in January 2015 in a paper published in the scientific journal *Nature* entitled “The geographical distribution of fossil fuels unused when limiting global warming to 2 degrees C.”³⁵ The study evaluates known fossil fuel reserves to determine, based on current emissions factors and global warming potential, how much should be left in-place to maximize the planet’s chances of remaining below 2 degrees C. Importantly, it quantifies the regional distribution of known fossil-fuel reserves and resources and, through modeling a range of scenarios based on least-cost climate policies, identifies geographically-specific resources that should not be burned between 2010 and 2050 to ensure the world stays

³² Copenhagen Accord ¶ 1, *agreed* Dec. 18, 2009, FCCC/CP/2009/11/Add.1, *available at* <http://unfccc.int/resource/docs/2009/cop15/eng/11a01.pdf> (“recognizing the scientific view that the increase in global temperature should be below 2 degrees Celsius” relative to pre-industrial temperatures to “stabilize greenhouse gas concentration in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system”); *id.* at ¶ 2 (agreeing that “deep cuts in global emissions are required according to science” to meet this goal).

³³ The United States and other signatory nations committed to reducing greenhouse gas emissions “well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels.” Paris Agreement art. 2, ¶ 1(a), *adopted* Dec. 12, 2015, FCCC/CP/2015/L.9, *available at* <http://unfccc.int/resource/docs/2015/cop21/eng/109r01.pdf>. The authority cited in the letter is being provided via regulations.gov and it should be included in the administrative record for this decision.

³⁴ The IPCC has produced and reviewed a carbon budget for the planet in all assessment reports (Ciais et al., 2013; Denman et al., 2007; Prentice et al., 2001; Schimel et al., 1995; Watson et al., 1990), as well as by others (e.g. Ballantyne et al., 2012). These assessments included carbon budget estimates for the decades of the 1980s, 1990s (Denman et al., 2007) and, most recently, the period 2002–2011 (Ciais et al., 2013). The IPCC methodology has been adapted and used by the Global Carbon Project (GCP, www.globalcarbonproject.org), which has coordinated a cooperative community effort for the annual publication of global carbon budgets up to the year 2005 (Raupach et al., 2007), 2006 (Canadell et al., 2007), 2007 (published online; GCP, 2007), 2008 (Le Quéré et al., 2009), 2009 (Friedlingstein et al., 2010), 2010 (Peters et al., 2012b), 2012 (Le Quéré et al., 2013; Peters et al., 2013), 2013 (Le Quéré et al., 2014), and most recently 2014 (Friedlingstein et al., 2014; Le Quéré et al., 2015). Each of these papers updated previous estimates with the latest available information for the entire time series. From 2008, these publications projected fossil fuel emissions for one additional year using the projected world gross domestic product (GDP) and estimated trends in the carbon intensity of the global economy (Rogelj, 2016).

³⁵ McGlade, Christophe and Paul Ekins, *The Geographical Distribution of Fossil Fuels Unused When Limiting Global Warming to 2 °C*, 517 *Nature* (187) (2015).

within a 2-degree C limit in the most cost-efficient manner.³⁶ This study demonstrates two important facts: first, one way in which geographically-specific analysis can be undertaken to make comparative judgments about the appropriateness of tapping into different resources and plays, and, second, that policy priorities can be brought into such an analysis—in McGlade et al it was cost-efficiency, but priorities like land use intensity, water demand, or impact on sensitive resources could as well. In addition to being the analytic source of ignition for the self-proclaimed “Keep it in the Ground” movement, the paper spawned a number of related inquiries looking at modified scenarios and derivative analysis examining U.S. demand scenarios in the specific context of already-leased federal fossil energy resources.³⁷ Attachment 1 provides a fuller discussion of the literature.

Reaching international climate commitments, including the Paris Agreement goals, will require the U.S. to adopt measures that reduce the GHG associated with production of fossil fuels on public lands in addition to efforts to reduce GHG from power plants and fuel efficiency for vehicles.³⁸ Nearly all other significant federal activities have had GHG reduction targets set for them (see Appendix 1)—it is time to put a similar set of performance targets in place for federal fossil energy leasing and production. As described below, it also will require measures that phase down the supply of fossil fuels from federal lands starting with the coal PEIS.

4. Methodologies exist for developing a “carbon budget” for fossil energy from federal lands.

We propose that the BLM develop a carbon budget for all fossil fuels produced from public lands, and derive from that analysis a coal-specific target.

As contemplated in the Federal Register notice announcing the preparation of the PEIS for the coal program, the BLM can better align leasing and production decisions with national climate change commitments by establishing (as a matter of policy) targets – a so-called “budget” – for the amount of federal coal production and desired additional leasing over a specified time period that would be consistent with current reduction targets. 81 Fed. Reg. at 17,727. This “budget” would effectively determine a production curve and leasing schedule that is consistent with U.S. climate goals and commitments, honors valid existing rights, and better anticipates the future market demand for coal in an increasingly carbon-constrained economy.

As discussed elsewhere in these comments, the BLM is clearly required to measure, evaluate and fully consider the GHG emissions and climate change impacts of the federal coal program in the PEIS based on a number of policies of the BLM and other agencies, and even the President. NEPA also requires the BLM to fully consider climate change issues in the PEIS. This analysis must inform BLM’s requirements to avoid, minimize and compensate for these impacts consistent with this country’s climate change commitments, specifically the requirement to reduce emissions by 26 to 28 percent below 2005 levels by 2025. This analysis and decision-

³⁶ See *id.* at 187-90.

³⁷ CEA 2016, Vulcan/ICF 2016, Erickson and Lazarus 2016, and Fulton, Kaplow, Capalino, and Grant 2016.

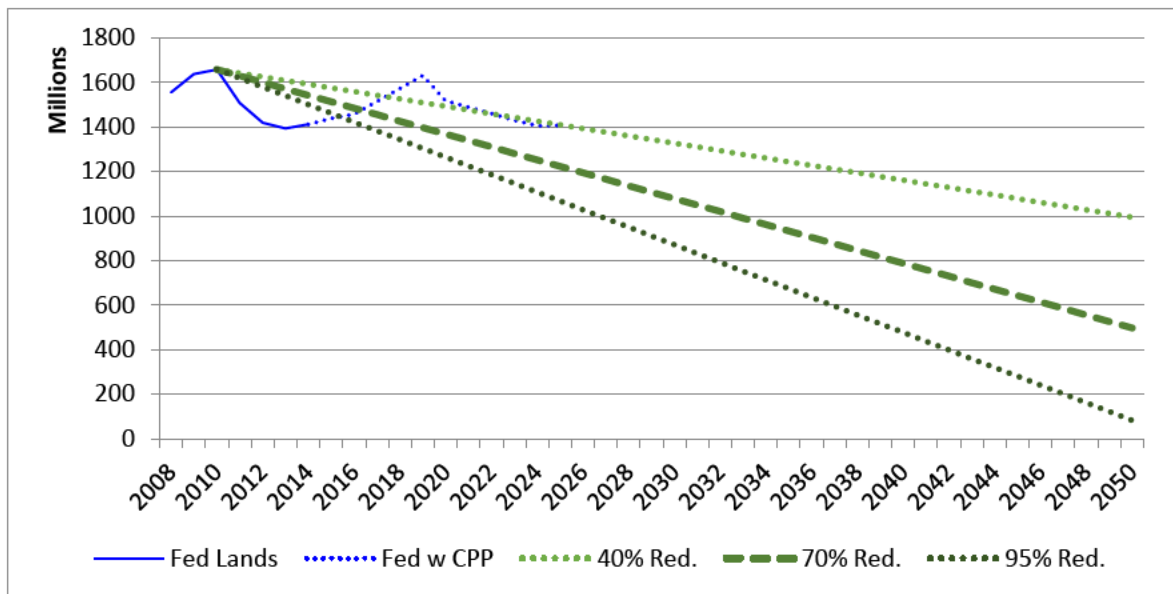
³⁸ 80 Fed. Reg. 64,662 (Oct. 23, 2015) (existing power plants); 80 Fed. Reg. 64,510 (Oct. 23, 2015) (new power plants); 77 Fed. Reg. 62,624 (Oct. 15, 2012) (light-duty vehicles); 76 Fed. Reg. 57,106 (Sept. 15, 2011) (medium- and heavy-duty vehicles).

making should seek to achieve a no more than 2 degrees C temperature increase, which will require the U.S. to reduce emissions an average of 70 to 80 percent below 2000 levels by 2050. This will require that a carbon budget be developed that limits carbon emissions from federal energy development to below 500m metric tons CO₂e by 2050.

Determining a “carbon budget” involves addressing a number of complicated factors including time horizon, target temperature, role of land use change, units, short-term climate pollutant emissions (like methane), aerosol emissions, climate sensitivity, and probability of success. Nevertheless, the approach is increasingly in use and a growing community of practice has demonstrated that such an approach is possible to calculate for federal lands.

For example, we at The Wilderness Society followed a common approach using publicly-available data.³⁹ We determined that that lifecycle federal emissions should be less than 500 million metric tons carbon dioxide equivalent (MTCO₂e) by 2050—which will require at least a 70 percent reduction in emissions from all fossil energy resources. Direct (sometimes called “upstream”) emissions must fall at least to 25 million MTCO₂e to stay within the “carbon budget” for public lands as a share of total U.S. national emissions.

Table 1: TWS Analysis of Federal Lifecycle CO₂e Compared to IPCC 2°C and 1.5°C Reduction Goals



We provide the results from our assessment of a “carbon budget” for federal lands to illustrate that such an exercise can be conducted with available data provided key assumptions are disclosed, and encourage BLM to prepare its own analysis utilizing a similar approach. From there, BLM can create a coal target based on coal’s projected future share of federal fossil energy

³⁹ This analysis will be detailed in a forthcoming whitepaper that presents our results, calculations, and highlights key assumptions and provides links to data elements. We will provide that information as supplemental comment and, as appropriate, incorporate it herein by reference.

production and/or CO₂e emissions.⁴⁰ We recommend the agency focus on simple scenarios, rather than complex models, to establish leasing targets based on a “carbon budget” analysis. A scenario-based approach was used by the Carbon Tracker Initiative in determining a critical input (future demand for Powder River Basin coal under a 2-degree scenario) used in their recent report reviewing the necessity of future federal coal leasing.⁴¹ This approach should be closely examined by the agency for potential use in establishing a coal production target under a fossil energy “carbon budget” for the Department. We will explore this and alternative methods more fully in our forthcoming whitepaper.

5. Incorporating budgets into a carbon management system.

We further recommend integrating the results of these analyses into a “carbon management system” at the Department-level for all fossil fuel energy including oil, gas and coal. A key element of this approach is tracking and disclosing emissions to measure progress and ensure accountability. And this system would also develop emissions reduction targets in accordance with national and international climate commitments as a basis for ensuring alignment, identifying new reduction opportunities and making future leasing determinations.

The carbon budget analysis serves as the basis for setting these targets, and would be used to inform decision making by the agency as part of a carbon management system. It could also be used when evaluating new policies, in NEPA processes or to dictate actual leasing decisions. While a carbon budget should be developed for all energy resources on federal lands, we believe that applying this concept to the coal leasing program is a logical starting point presented by the PEIS. The coal budget (measured in terms of CO₂e) will provide a target for the agency to stay below when making leasing decisions. The agency could consider how each new lease impacts the budget and, while a more robust system could be used to construct a firm limit or “hard cap” in the future, we recommend the budget be used to develop “soft targets” to guide decisions in the near term. Thus, we envision the coal budget playing an integral role in the agency’s determination of what, where and how much coal will be made available for lease. It should be incorporated into the proposed leasing process described in Section IV.H above.

6. Benefits of using a carbon management system.

This framework could provide great benefit for managers and stakeholders alike. A well-designed carbon management system based on a carbon budget for public lands would:

- Raise the profile of GHG emissions reductions within federal land management agencies responsible for overseeing development of public-owned energy assets by setting targets and creating accountability for making progress toward those targets;
- Enable development of a clear, sensibly devised emissions reduction profile for the long term which would provide direction and predictability to business and policy makers;
- Provide a structure for regular monitoring and review of targets;
- Underscore the necessity of accurate data and metrics based on strong science;

⁴⁰ This determination is based on scenario modeling and therefore will require the agency to be transparent with its methods.

⁴¹ Fulton 2016.

- Provide flexibility for achieving reductions in different aspects of federal land management over time.
- When used in conjunction with coal leasing, this could increase competition in the bidding process and incentive development of high potential/economically viable areas. It could also reduce the amount of speculative leasing and possibly lead to operators giving up leases they currently hold in low potential or economically unfavorable areas for alternative parcels.

7. Legal authority.

As discussed repeatedly in these comments, there is no doubt the BLM has the legal authority to pursue development of a coal budget and a carbon budget. This authority is provided under the MLA, FLPMA, and NEPA. These responsibilities are reiterated in the CEQ NEPA regulations as well as the BLM's federal coal regulations, as also discussed in numerous parts of these comments. A review of the most significant sources of this legal authority is set out in Section IX.A. and IX.B. of these comments. The BLM should recognize its authority—and indeed responsibility—and pursue development of a carbon budget and a coal budget.

8. Additional considerations.

We believe the carbon management system and coal budget are an important component of our overall recommendations for reducing the climate impacts from the federal coal program through this reform. That said, we understand that questions may arise regarding implementation of our recommendations - most importantly, the question of how compensatory mitigation might impact the budget.

As described above, the goals of the coal budget are to track and ultimately reduce emissions from the coal program to ensure that it is consistent with national climate goals and policies. The issue some might raise is that under our budget proposal, a new coal lease and the associated CO_{2e} emissions would count against the overall budget, which again, in and of itself, is intended to reduce climate impacts; at the same time, we propose compensatory mitigation requirements for new leases that may include offsets for greenhouse gas emissions and/or actions to support adaptation for the climate change impacts caused by the increased emissions.

In order to address this, it is important to understand how the budget interacts with the mitigation hierarchy. The hierarchy consists of avoidance, minimization and offsets/compensatory mitigation; the hierarchy must be pursued in that order to address potential impacts from a particular action (*See* Sections V and VI.F for additional discussion of mitigation in the broader context of the PEIS).

The carbon budget should be thought of as an avoidance mechanism or strategy. The goal of the budget is to reduce or “avoid” greenhouse gas emissions. In other words, individual actions or decisions, like the decision to lease additional coal, should always count against the budget because the budget in and of itself is part of the agency's strategy for reducing greenhouse gas emissions from the federal coal program.

This approach will also allow BLM track all emissions under the carbon/coal budget for inventory and recordkeeping purposes. Meaning regardless of compensatory mitigation, the agency can keep an emissions inventory showing total potential CO₂e emissions from producing, existing and new leases.

In addition to tracking and managing towards the overall coal emissions budget when considering new leases, the BLM should also require compensatory mitigation for new leases to address their specific impacts, including greenhouse gas emissions and associated climate change impacts. This approach is analogous to BLM's approach to mitigation under the sage grouse plans. There, the agency established regional surface disturbance caps and requirements that developers demonstrate a net benefit to grouse populations through implementation of compensatory mitigation. Under the grouse plans, while BLM may authorize impacts in areas that have not exceeded the disturbance cap, those impacts count against the cap *and* mitigation for the impacts is still required to demonstrate a net benefit to grouse. A similar approach is appropriate here.

Recommendations: BLM should develop a carbon budget and carbon management system for fossil fuels on public lands modeled after the analysis done by The Wilderness Society. Using the carbon budget, BLM should create a coal budget that will be used as a soft target and decision making tool. The budgets and carbon management system should play an integral role in the leasing process as proposed in Section IV.H. When considering new leases BLM should measure and manage toward the budget as well as requiring compensatory mitigation for the GHG emissions and climate change impacts new leases would cause.

E. BLM Must Ensure that the PEIS Addresses Mitigation for Climate Impacts Consistent with all Relevant Laws and Policies, including Current Mitigation Guidance

1. Consistent with the mitigation hierarchy, BLM must avoid, minimize and mitigate impacts from the federal coal program, including climate change impacts.

As discussed above, BLM has significant obligations and authority related to mitigation. Mitigating climate-related impacts includes avoiding and minimizing generation of GHG emissions, including protecting intact lands and applying management prescriptions to reduce emissions and harm to carbon sinks. However, there are acknowledged, serious and unavoidable climate impacts for the United States and the entire planet from the federal coal program, including upstream impacts from coal exploration and development and downstream impacts from coal transportation and combustion. The full lifecycle GHG emissions from federal coal accounted for 10 percent of the total U.S. GHG emissions in 2012.

In addition to the legal and policy direction that requires mitigation for climate impacts from the federal coal program and provide the agency with ample discretion to require mitigation, it is important to underscore that as a land manager, the federal government is facing huge and rapidly escalating costs to address the impacts caused by fossil-fuel driven climate change. Forest fires, widespread drought, rising sea levels, spread of invasive species and spread of disease already result in significant costs to the federal government, and each new coal lease the BLM authorizes increases these problems and the associated costs. Research from the University

of Vermont's Gund Institute for Ecological Economics and The Wilderness Society suggests that total costs in degraded ecosystem services could exceed \$14.5 billion annually under a 2-degree C warming scenario.⁴² These costs are ultimately borne by all American taxpayers, and BLM has a responsibility to recoup these costs when it makes decisions authorizing activities that directly cause these impacts and associated costs.

2. The programmatic nature of the Coal PEIS makes it the appropriate place to analyze and set up a framework to address climate impacts through mitigation.

Despite the clear requirements (discussed in detail above) that BLM analyze climate impacts from its decisions, BLM has to-date mostly failed to complete such analyses, arguing that, "... because the current state of climate science prevents the association of specific actions with specific climate-related effects, the BLM can neither: (a) Analyze the climate-related effects of BLM actions nor (b) Ascribe any significance to these potential effects." See, e.g., BLM Presentation *Incorporating Climate Change into BLM Planning and NEPA Processes*.⁴³ The agency has pointed to⁴⁴ CEQ's Draft Guidance emphasizes the "rule of reason" which, "... ensures that agencies are afforded the discretion, based on their expertise and experience, to determine whether and to what extent to prepare an analysis based on the availability of information, the usefulness of that information to the decision-making process and the public, **and the extent of the anticipated environmental consequences.**" CEQ Draft Guidance, page 5 (emphasis added). In particular, BLM has pointed to instruction in the Draft Guidance with regard to the extent of the anticipated environmental consequences directing agencies to "... consider both the context and the intensity." CEQ Draft Guidance, page 10.

This argument is specious at best and, as discussed above, has been rejected by the CEQ in its Climate Change NEPA Guidance report and increasingly by the courts. As detailed above, BLM is required to analyze these effects. There are existing, widely available science-based tools for doing so. And the GHG emissions and climate impacts from individual coal can and must be measured, and then commensurate mitigation actions taken. Moreover, the Draft Guidance clearly states that, "[i]t is essential . . . that federal agencies not rely on boilerplate text to avoid meaningful analysis, including consideration of alternatives or mitigation."

Regardless, because of the anticipated environmental consequences resulting from the entirety of the federal coal leasing program for the duration of the study period, the Coal PEIS is both an appropriate vehicle and a necessary context in which to analyze these emissions, and design a

⁴² See Esposito, Valerie; Phillips, Spencer; Boumans, Roelof; Moulaert, Azur; Boggs, Jennifer. 2011. "Climate change and ecosystem services: The contribution of and impacts on federal public lands in the United States." In: Watson, Alan; Murrieta-Saldivar, Joaquin; McBride, Brooke, comps. *Science and stewardship to protect and sustain wilderness values: Ninth World Wilderness Congress symposium*; November 6-13, 2009; Merida, Yucatan, Mexico. Proceedings RMRS-P-64. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. p. 155-164. Available at http://www.fs.fed.us/rm/pubs/rmrs_p064.pdf? (accessed July 23, 2016).

⁴³ Available at:

http://www.blm.gov/style/medialib/blm/wo/Planning_and_Renewable_Resources/presentations.Par.2279.File.pdf/Incorporating_Climate_Change_into_Planning_and_NEPA_Documents.pdf

⁴⁴ E.g., see BLM Protest Resolution notification 3100 (MT9221.AG), April 18, 2016. Available at http://www.blm.gov/style/medialib/blm/mt/blm_programs/energy/oil_and_gas/leasing/lease_sales/2016/may4_2016.Par.26452.File.dat/May%204%202016%20protest%20response%20%204-18-2016.pdf (accessed July 24, 2016).

framework for addressing mitigation. As discussed above, the programmatic nature of this PEIS makes it even more appropriate and important for BLM to measure and address these impacts as part of the PEIS. Though GHG emissions and climate impacts from individual coal leases may be small, their cumulative impacts are enormous, with full lifecycle emissions accounting for ten percent of all US GHG emissions. While downstream emissions, from use of coal, may be more attenuated than upstream emissions from exploration and production, BLM can and should evaluate and estimate these impacts, then develop commensurate mitigation requirements.

3. BLM should develop a compensatory mitigation framework for addressing unavoidable climate impacts in its draft alternatives.

For unavoidable climate change impacts associated with leasing and development of coal resources, BLM should develop a framework in the PEIS that can be used for the entire program. We will be releasing a longer whitepaper going into greater detail on key design considerations and operational elements in August 2016 and will provide as supplemental comment. In the meantime, this letter spells out the basic framework.

To establish this framework, BLM must quantify through the PEIS the GHG emissions using the tools described in Section VI.C, and analyze the climate impacts associated with these GHG emissions using the tools described in Section VI.D.

The BLM should establish in the Record of Decision as a matter of policy that the agency will require compensatory mitigation to offset the climate impacts of federal coal leasing and production. The same tools should be required to be used for future lease-level analysis with guidance for field staff on how to apply them. The estimated impacts resulting from the analysis represent unavoidable climate impacts that should be addressed through compensatory mitigation.

As part of the compensatory mitigation policy, the BLM should initiate a regional mitigation strategy/plan for key coal leasing areas that addresses all impacts include climate. BLM should consider several key design features that should be spelled out in the ROD:

- *BLM should consider compensatory mitigation actions that offset the climate impacts associated with the emissions attributable to the leased coal in question, and that offset the carbon emissions themselves.*

Quantifying impacts is becoming increasingly more practical, and the science connecting impacts to temperature changes increasingly more precise. The practice of arriving at a mitigation fee at a lease level can be challenging, but real harm will be felt by human and natural communities. Compensatory mitigation funds can be directed at enhancing the adaptive capacity of human and natural communities in the affected landscape to improve their health and resilience in the face of expected change. Offsetting actions can include investments in land protection, restoration or rehabilitation. They can also include payments to communities to assist with a transition away from coal-dependent regional economy.

Significant opportunity also exists to offset the GHG emissions themselves. EPA has repeatedly urged land management agencies to assess carbon offsets in EAs and EISs as a way to reduce

climate change impacts of agency actions. EPA has specifically noted that offsets are a reasonable alternative to lessen the impacts of coal mine methane emissions. In a 2007 letter concerning a proposal to permit MDWs at the West Elk Mine, EPA specifically rejected the Forest Service’s assertion that a carbon offset alternative was not reasonable: “[I]t is reasonable to consider offset mitigation for the release of methane, as appropriate. Acquiring offsets to counter the greenhouse gas impacts of a particular project is something that *thousands of organizations, including private corporations, are doing today.*”⁴⁵ EPA specifically recommended that the Forest Service’s Lease Modifications EIS “acknowledge that revenues for carbon credits are available via several existing markets.”⁴⁶ Similarly, EPA has recommended that a Forest Service NEPA analysis of a forest health project “discuss reasonable alternatives and/or potential means to mitigate *or offset* the GHG emissions from the action.”⁴⁷ Numerous state agencies already use offsets to control GHG emissions.⁴⁸ Offsets can include participation in third-party offset markets or renewable energy credits.

The potential for federal participation in an offsets program is well demonstrated by actions that have been taken relative to emissions from the Navajo Generating Station in Arizona to comply with Clean Air Act requirements pursuant to EPA’s regional haze rules. There, in agreement with state, federal, tribal and NGO participants, the DOI has committed to reduce or offset federal carbon dioxide emissions by three percent annually for a total of 11.3 million metric tons of emissions reductions by the end of 2031.⁴⁹ This is intended to reduce carbon dioxide emissions and demonstrate the workability of a credit-based system to achieve carbon dioxide emission reductions. In addition, the DOI has committed to facilitating development of Clean Energy Projects intended to achieve eighty percent generation of clean energy for the federal share at the Navajo Generating Station by 2035 by securing over twenty-six million megawatt hours in Clean Energy Development Credits.⁵⁰

Knowing that not every option may be available in all instances, the BLM should specify the priority order for investment amongst the several options. We recommend every effort be taken to offset the carbon emissions from the coal program.

- *BLM should attempt to address the full scope of lifecycle emissions through compensatory mitigation – that is, production, transport and combustion.*

The premise of compensatory mitigation is to address unavoidable harm. In the case of federal coal, the harm is significant and primarily attributable to end-use combustion. The BLM should

⁴⁵ Letter of L. Svoboda, EPA to C. Richmond, Forest Service (Aug. 7, 2007) at 7 (emphasis added).

⁴⁶ EPA July 2012 Comment Letter (Ex. 29) at 5 (identifying four U.S. carbon exchanges creating a market for carbon credits).

⁴⁷ Letter of L. Svoboda, EPA, to T. Malecek, USFS, at 8 (Oct. 27, 2010).

⁴⁸ See, e.g., Settlement Agreement, ConocoPhillips and California (Sept. 10, 2007) (California agency requiring offsets as a condition of approving a project), attached as Ex. 46; Minn. Stat. § 216H.03 subd. 4(b) (Minnesota law requiring offsets for certain new coal-fired power plants); Me. Rev. Stat. Ann. tit. 38, § 580-B(4)(c) (Maine law establishing greenhouse gas initiative that includes the use of carbon offsets).

⁴⁹ See https://www.doi.gov/sites/doi.gov/files/migrated/upload/7-25-2013-NGS-TWG-Agreement-FINAL_Executed.pdf (presenting the Technical Work Group Agreement Related to Navajo Generating Station (NGS)).

⁵⁰ *Id.*

make every effort to address this but at least establish a regime capable of addressing the direct emissions that could be avoided or minimized by regulatory action.

- *BLM should specify whether compensatory mitigation should be paid on an annual basis or paid up front.*

In lieu fees collected for compensatory mitigation are often paid in lump sum at the beginning of a project's operational life. In the case of climate impacts, it may make more sense to consider an annual payment on the basis of production, or an annualized payment schedule based on expected production with corrections on a semi-annual basis. By spreading payments over the life of the project (and tying them to when the impacts actually occur), the system should be both fairer to producers and truer to the spirit of mitigation.

- *BLM must ensure mitigation actions are additional—that is, result in actions that add real, verifiable carbon savings or other benefit—and durable—that is, the conservation benefit lasts for at least a period of time commensurate with the duration of the impact itself.*

This is an established principle for the Department's approach to mitigation but is particularly important with regard to climate impacts. For example, the Australian Government's Climate Change Authority found that, "Assessing additionality is a key feature of all baseline and credit schemes. An additionality test assesses whether a project or activity creates 'additional' emissions reduction that would not have occurred in the absence of the incentive. The baseline for the project assesses how much emissions have been reduced. Additionality is important to ensure that a baseline and credit scheme does not pay for emissions reductions that would have occurred anyway."⁵¹

- *BLM should specify when mitigation terms apply to existing leases.*

Mitigation terms should be applied as broadly and comprehensively as possible. With regard to climate impacts, so much coal is under lease that simply limiting a compensatory mitigation approach to future new leasing will do little to address the climate harms known to result from leasing and production of federal coal. The BLM should look at a transparent and fair method to incorporate these requirements when significant modifications are sought for existing leases, as well as ensuring new leases include these provisions.

F. BLM Should Evaluate Addressing Externalities Associated with Carbon Emissions Resulting from Leasing and Production of Federal Coal Through Royalty Rates or Additional Fees.

Another approach to managing the carbon emissions associated with the Federal Coal Program is by addressing the costs borne by society due to federal coal leasing and production through economic tools designed to ensure that taxpayers receive a fair return. Referred to by some as a

⁵¹ See <http://www.climatechangeauthority.gov.au/reviews/carbon-farming-initiative-study/additionality>

carbon adder, such an approach increases the price paid to the federal government for the use of federal coal to reflect some or all of its climate costs (*i.e.*, climate externality).⁵² Some have argued that such an adder could be incorporated into the existing bonus bid, rents, or royalty paid on federal coal sales because it offers the administratively simplest and most efficient strategy, and because of the potential for states and communities impacted by reductions in coal mining to receive a portion revenue generated by the adder even as coal production declines.⁵³ An adder could be set at a price to address emissions associated with lifecycle emissions of federal coal or just the direct (upstream) emissions of from coal mining.⁵⁴ Fully incorporating the lifecycle costs would potentially result in a very large price increase, but could be phased in.⁵⁵ Another approach would be for DOI to initially apply an upstream (direct) carbon adder for all fossil production, including coal, as part of the royalty rate. In a forthcoming paper, we will demonstrate in more detail how this approach has myriad benefits, including market flexibility so that least cost options will be made, clearly under the purview of DOI and BLM, more straightforward and transparent than a lifecycle cost, increases taxpayer fairness by beginning to internalize externalities and increasing state and federal revenue, is complimentary to leasing reform. Lastly, “The statutory case for a BLM coal pricing initiative appears to be stronger than the case against it since BLM is required to consider the environment when making multiple use decisions for public land. BLM’s leasing statutes also appear to afford the agency a significant amount of discretion to set the financial terms of coal leases.”⁵⁶

Recommendations: BLM should consider adjusting bonus bids, rents, and royalties to address the associated externalities (a so-called “carbon adder”) as a pathway to meeting its goals to reduce climate emissions from the federal coal program consistent with national climate commitments.

G. BLM Can Also Directly Regulate Climate Emissions.

BLM also has the authority—and we believe the obligation—to reduce climate emissions from the federal coal program through regulation. The PEIS should examine and advance regulations to reduce the emissions of methane and other greenhouse gases from coal mining operations. BLM has already taken steps in this direction with an advance notice of proposed rulemaking to regulate methane that is released as a direct results of mining operations, known as waste mine

⁵² A.J. Krupnick et al., “Putting a Carbon Charge on Federal Coal: Legal and Economic Issues”, Resources for the Future Discussion Paper 15--13, 2015, Washington, DC: RFF. Available at <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-15-13.pdf>. Last accessed, July 22, 2016.

⁵³ Krupnick et al.; T. Gerarden, W. Spencer Reeder, and J. Stock, “Federal Coal Program Reform, the Clean Power Plan, and the Interaction of Upstream and Downstream Climate Policies,” April 2016. Available at http://scholar.harvard.edu/files/stock/files/fedcoal_cpp_v9.pdf. Last accessed July 22, 2016. Note that under existing law, the government’s authority to share revenue collected from federal coal leasing and production is limited. See Baldwin, Pamela. 2010. “Fair Market Value for Wind and Solar Development on Public Land.” Whitepaper commissioned by The Wilderness Society and Taxpayers for Common Sense. Pages 21-24. Available at <https://wilderness.org/sites/default/files/Fair-Market-Value-Whitepaper.pdf> (accessed July 26, 2016).

⁵⁴ For an in-depth look at the distinction between lifecycle and direct (upstream) emissions, see Burger, Michael and Wentz, Jessica. 2016. “Downstream and Upstream Greenhouse Gas Emissions: The Proper Scope of NEPA Review.” Forthcoming working paper.

⁵⁵ Krupnick et al.

⁵⁶ Krupnick, et al. p. 3.

methane. BLM should move forward with the Coal Mine Waste rule and, through the PEIS, examine other rules to reduce greenhouse gas emissions from coal mining operations.

1. Reducing methane emissions from public lands is important.

According to BLM, emissions of methane make up nearly nine percent of all the greenhouse gas emitted as a result of human activities in the United States. Since 1990, methane pollution in the United States has decreased by eleven percent, even as activities that can produce methane have increased. However, methane pollution is projected to increase to a level equivalent to over 620 million tons of carbon dioxide pollution in 2030 absent additional action to reduce emissions. BLM recognized that “[r]educing methane emissions is a powerful way to take action on climate change.”⁵⁷ Although methane emissions from coal mines account for only about 6.3 percent of the total lifecycle emissions for coal used to produce electricity,⁵⁸ an analysis by The Wilderness Society suggests that implementation of the Mine Methane Waste Rule could reduce direct emissions from the federal coal program by an estimated 2.4 million MT_{CO2e}.⁵⁹

2. BLM has the authority to regulate methane emissions from coal mining.

In 2014, the BLM issued an Advance Notice of Proposed Rulemaking to reduce methane from mining operations on public lands.⁶⁰ BLM cited its authority for regulation methane waste: “The authority for the BLM to address the capture, use, or destruction of waste mine methane across 700 million acres of Federal mineral estate comes from the Mineral Leasing Act.”

The ANPR also recognizes that methane is emitted “not only from underground coal mines, but also from active surface coal mines and post-mining operations, as well as abandoned or closed underground coal mines.”⁶¹ BLM should consider regulations to reduce emissions from these sources as well.

Recommendations: The BLM should examine and advance regulations to reduce the emissions of methane and other greenhouse gases from coal mining operations, both underground and surface operations. Unless and until those regulations are complete, the BLM should immediately consider other options to offset these emissions or otherwise address the associated climate impacts.

⁵⁷ From BLM to Examine Steps to Reduce Methane from Mining Operations on Public Lands, at http://www.blm.gov/ut/st/en/info/newsroom/2014/april/blm_to_examine_steps.html.

⁵⁸ Whitaker et al., Harmonization of Coal Life Cycle GHG Emissions, Yale University, 2012. <http://onlinelibrary.wiley.com/doi/10.1111/j.1530-9290.2012.00465.x/pdf>

⁵⁹ Ratledge, Nathan. Unpublished analysis of carbon emissions reduction potential of current and proposed rules at the Department of the Interior and related agencies. October 2015. Available upon request.

⁶⁰ Waste Mine Methane Capture, Use, Sale, or Destruction, A Proposed Rule by the Bureau of Land Management on April 29, 2014, 79 FR 23923, RIN 1004-AE23. <https://www.federalregister.gov/articles/2014/04/29/2014-09688/waste-mine-methane-capture-use-sale-or-destruction>.

⁶¹ *Id.*

VII. BLM SHOULD CONSIDER A ROBUST RANGE OF ALTERNATIVES TO ADDRESS THE COMPLEX CONSIDERATIONS IN THE PEIS.

A. BLM Should Develop a Broad Range of Alternatives That Considers Avoiding Environmental Harm and Supporting Conservation.

The range of alternatives is “the heart of the environmental impact statement.” 40 C.F.R. § 1502.14. NEPA requires BLM to “rigorously explore and objectively evaluate” a range of alternatives to proposed federal actions. *See* 40 C.F.R. §§ 1502.14(a) and 1508.25(c).

NEPA’s requirement that alternatives be studied, developed, and described both guides the substance of environmental decision-making and provides evidence that the mandated decision-making process has actually taken place. Informed and meaningful consideration of alternatives -- including the no action alternative -- is thus an integral part of the statutory scheme.

Bob Marshall Alliance v. Hodel, 852 F.2d 1223, 1228 (9th Cir. 1988), *cert. denied*, 489 U.S. 1066 (1989) (citations and emphasis omitted).

An agency violates NEPA by failing to “rigorously explore and objectively evaluate all reasonable alternatives” to the proposed action. *City of Tenakee Springs v. Clough*, 915 F.2d 1308, 1310 (9th Cir. 1990) (quoting 40 C.F.R. § 1502.14). This evaluation extends to considering more environmentally protective alternatives and mitigation measures. *See, e.g., Kootenai Tribe of Idaho v. Veneman*, 313 F.3d 1094, 1122-1123 (9th Cir. 2002) (and cases cited therein); *see also Env’t Defense Fund., Inc. v. U.S. Army Corps. of Eng’rs*, 492 F.2d 1123, 1135 (5th Cir. 1974); *City of New York v. Dept. of Transp.*, 715 F.2d 732, 743 (2nd Cir. 1983) (NEPA’s requirement for consideration of a range of alternatives is intended to prevent the EIS from becoming “a foreordained formality.”); *Utahns for Better Transportation v. U.S. Dept. of Transp.*, 305 F.3d 1152 (10th Cir. 2002), *modified in part on other grounds*, 319 F.3d 1207 (2003); *Or. Env’tl. Council v. Kunzman*, 614 F.Supp. 657, 659-660 (D. Or. 1985) (stating that the alternatives that must be considered under NEPA are those that would “avoid or minimize” adverse environmental effects).

In recent cases, courts have found NEPA violations based on an agency’s failure to evaluate a conservation-oriented alternative. *See, e.g., New Mexico v. BLM*, 565 F.3d 683, 710-711 (10th Cir. 2009) (Alternative considering closing Otero Mesa to oil and gas leasing must be considered as part of oil and gas amendment to governing land use plan); *Colorado Environmental Coalition v. Salazar*, 875 F.Supp.2d 1233, 1249-1250 (D.Colo. 2012) (BLM required to consider community alternative protecting Roan Plateau from surface disturbance). Accordingly, the BLM should consider a range of alternatives that includes protecting other resources and values in developing alternatives in the Coal PEIS.

Further, the BLM should fully evaluate a true range of alternatives, rather than setting up alternatives that are at far ends of a spectrum with one “compromise.” An agency violates its obligation to consider a reasonable range of alternatives and to take NEPA’s hard look at environmental impacts when it only looks at “straw men” for comparison, which the agency has

no intention of accepting and are put forth only to lead to the agency's already foregone conclusion. *See, e.g., California v. Block*, 690 F.2d 753 (9th Cir. 1982); *Blue Mountains Diversity Project v. U.S. Forest Service*, 229 F.Supp.2d 1140 (D.Or. 2002); *Oregon Natural Desert Association v. Singleton*, 47 F.Supp.2d 1182 (D.Or. 1998). In the context of the Coal PEIS, there are a variety of issues to be addressed and tools to be considered that merit a range of alternatives that is both broad in terms of options and deep in terms of the level of analysis completed. This will provide the agency with a thorough range of options from which to develop its final PEIS.

B. BLM Should Evaluate a Range of Tools to Achieve Climate Goals.

A goal of the PEIS is to reduce climate emissions from the federal coal program consistent with national climate commitments. To achieve that goal, the BLM should establish a reduction target for public lands of at least 70% by 2050 and create a measurement protocol for federal lands emissions, regularly disclosing progress towards meeting that target and developing new policies that yield reductions. There are several policy pathways that lead towards meeting this goal, which can be applied in a manner that is fair, efficient and consistent with existing laws, as discussed in detail above. A range of alternatives will give the agency the opportunity to evaluate a variety of approaches and ultimately incorporate the best elements into this final PEIS.

Consequently, we recommend that BLM develop alternatives that evaluate the suite of policies that could be used to meet climate goals, including:

- Incorporating a carbon adder into the royalty rate for coal. While measurement and assessment of impacts from upstream emissions (from exploration and production) may be easier to quantify and downstream emissions (from transportation and combustion) may be more challenging because they are more attenuated, a carbon adder may be useful in one or both contexts by offering a straightforward approach and a mechanism to direct funding directly to states and local communities.
- Developing and applying mitigation measures consistent with the mitigation hierarchy, including compensatory mitigation requirements to offset climate impacts.
- Developing a carbon budget and management framework for all fossil fuels developed on federal lands that includes a targeted budget for coal. The budget should inform decisions made by the agency and could be used as a cap to limit future coal sales.
- Incorporating a range of tools to measure carbon emissions and impacts from those emissions, including those discussed above and others that may be under development.

C. BLM Should Evaluate a Range of Approaches to Meet Other Goals of Reforming the Coal Program.

In addition to a range of alternatives that includes a focus on reducing environmental impacts and methods to meet climate goals, BLM should evaluate a range of alternatives to meet the other goals of the PEIS, including;

- Developing a regional mitigation strategy for the Coal PEIS and/or developing regional mitigation strategies that are focused on high priority areas.

- Amending all affected plans or amending a set of priority plans where ongoing development and risks to communities are highest and setting up an approach for remaining plans.
- Incorporating transition approaches for affected communities that can be a set of common elements or tailored to specific regions or communities, or simply setting out priority areas where transition will be addressed.
- Evaluating use of royalty rates or mitigation or a combination thereof to address impacts to resources and communities.
- Eliminating LBA or incorporating LBA into a more proactively managed regional leasing program.
- Identifying opportunities to incentivize competition, which could include bidding on a set Btu of coal, or determining what role competition can play in other ways.
- Including a range of tools to ensure a fair return to taxpayers from the federal coal program. At a minimum this means identifying and ensuring fair market value for coal produced. It also includes evaluating the other public benefits that would be gained from contracting the coal program and considering whether and how royalty rates, bonding amounts and reclamation standards should be adjusted.

D. A Preliminary Range of Alternatives Should Be Set out in BLM’s Scoping Report, along with an Initial Purpose and Need.

An initial version of the broad range of alternatives should be defined in the report BLM will be producing regarding the scoping process and information gained to date. The scoping process will help to define the range of alternatives under consideration and these initial conclusions should be presented to the public. Similarly, the report can set out the agency’s initial approach to the purpose and need for the PEIS, which is a vital part of defining the range of alternatives.

Recommendations: Through this PEIS, the BLM can and should protect natural and cultural values through various management decisions, including by excluding or limiting certain uses of the public lands. *See*, 43 U.S.C. § 1712(e). Incorporating a robust range of alternatives to address the significant set of issues impacted by the Coal PEIS will require evaluating opportunities and tools to protect other resources, meet climate goals, and improve the fair return of the program as a whole. Setting out an initial purpose and need and range of alternatives in the scoping report will ensure that both the agency and stakeholders get the most benefit from the information provided through the scoping process. Developing a range of alternatives with sufficient breadth and depth will provide the best opportunities to arrive at the most effective set of reforms for the federal coal program.

VIII. PLANNING FOR A FUTURE WITH DECLINING COAL PRODUCTION.

Communities that are largely dependent on mining publicly-owned coal are already feeling the impacts of structural changes in the coal industry. Compared to 2008, coal production in the Powder River Basin was down by 19 percent in 2015, a decrease of nearly one-fifth in just eight years. Across EIA’s Western Region, where most federally-owned coal is located, over the same period coal mining jobs went from 15,177 down to 14,100, a seven percent decrease. Colorado

has lost roughly 320 coal mining jobs since January 2015, or 20 percent of jobs at mines.⁶² Workers and their families have borne the brunt of these changes, losing jobs, facing unmet healthcare needs and dealing with the emotional impacts of suffering dramatic changes to their lives and those of their neighbors.

Going forward, coal-dependent communities in the West will continue to experience declines in employment and revenue. EIA's *Annual Energy Outlook 2016* (AEO2016) reference case projects that coal production in the Western Region will fall by 155 million tons between 2015 and 2040.⁶³ These changes have occurred without any significant new policies or regulations specific to the federal coal program, driven by gains in productivity and loss of market share to natural gas and renewable energy.

The federal coal program should help communities become more resilient to the accelerating changes in the coal sector. A significant part of federal coal program reform and the PEIS should include taking action to address current job losses and mine closures and create more resilient economies in future.

A. Coal-dependent Communities.

In the West, some 45 mines with federal coal leases are spread across 27 counties in seven states.⁶⁴ The degree to which different counties and communities depend on coal varies, but all are reliant on coal mining for jobs, taxes, and federal royalties to a significant extent. Counties where coal-fired power plants are located at the mouth of the coal mine or where coal mines supply coal to only one nearby power plant are more economically dependent on the coal industry. Prime examples include Moffat and Routt Counties in Colorado, Emery County in Utah, and Campbell, Lincoln, and Sweetwater Counties in Wyoming.⁶⁵

B. Socio-economic Analysis Is Needed.

As part of the PEIS, the BLM should look carefully at each county where federal coal plays a significant role in the local economy to understand the past, current and future economic and social impacts of the coal mining and associated power plants. This analysis should serve as the basis for designing measures to help communities plan for a future with declining coal extraction and energy generation.

As BLM reviews socio-economic impacts of federal coal leasing and development, it should consider the positive *and* negative impacts of continued economic reliance of local communities

⁶² Colorado Division of Reclamation, Mining and Safety Monthly Coal Summary Reports, <http://mining.state.co.us/Reports/Reports/Pages/Coal.aspx>. Last accessed July 26, 2016. See also, <http://www.denverpost.com/2016/05/14/collapse-of-colorado-coal-industry-leaves-mining-towns-unsure-whats-next/>.

⁶³ <http://www.eia.gov/todayinenergy/detail.cfm?id=26992>

⁶⁴ Colorado, 7 counties; Montana, 5 counties; North Dakota, 4 counties; New Mexico, 2 counties; Utah, 3 counties; Washington, 1 county; Wyoming, 5 counties. Based on data from MSHA BLM Coal Mine Crosswalk Feb. 3, 2015. Pers. Comm. From Mark Haggerty, Headwaters Economics, July 15, 2016.

⁶⁵ Form EIA-923 detailed data, <https://www.eia.gov/electricity/data/eia923/>. Last accessed, July 22, 2016.

on coal extraction. Some research has shown that dependence on coal adversely affects non-coal employment in places like Appalachia.⁶⁶ They found that high levels of coal employment are associated with lower levels of entrepreneurship and higher levels of migration out of Appalachian regions as coal crowds out other types of businesses. Prolonging coal employment may actually slow the transition to other economic activities and reduce long-term economic growth.

C. Transition Planning and Programs Should Be Assessed in the PEIS.

BLM can and should help communities plan for the future through the PEIS. BLM should both provide analysis of current and projected economic conditions *and* put in place programs that can help with coal-dependent economies become more resilient to changing conditions. BLM's efforts should include the following:

Support communities' creation of impact mitigation plans. Given the relatively small number of counties and communities engaged in mining of federal coal, BLM should work with communities to conduct analyses of the socio-economic characteristics of each county in which federal coal is mined. BLM should, among other things, use the Economical Profile System (EPS) and produce detailed socioeconomic profiles.⁶⁷ BLM should incorporate best practices for social impact assessment, including involving potentially affected publics and developing mitigation plans.⁶⁸ BLM could incorporate transition approaches for affected communities both in the PEIS and through targeted RMP amendments or revisions for areas with current mining operations.

Identify mechanisms through which the Department of the Interior can assist communities become stronger and more resilient in the face of rapidly changing economic conditions.

Use mitigation planning and funding. In section VI. G., we recommend that BLM implement a comprehensive mitigation program that could provide both financial resources and job opportunities to local communities to address the impacts of coal mining and climate change. In that section, we argue that BLM should evaluate mechanisms that would allow communities to share in revenue generated by efforts to capture environmental externalities in the cost of federal coal, whether through efforts to address compensatory mitigation or a carbon adder. The BLM should explore every opportunity to ensure financial and other resources are made available to assist in repositioning resource-dependent communities to succeed in the next energy economy.

Develop a program to hire mine workers for restoration and rehabilitation beyond the mine site. BLM should also propose a program to employ the skills of mine workers in restoration and rehabilitation of public lands, aimed at both improving resilience of public lands in the face of climate change and their ability to mitigate climate change through biological sequestration.

⁶⁶ Michael R. Betz, Mark D. Partridge, Michael Farren, Linda Lobao, Coal mining, economic development, and the natural resources curse, *Energy Economics*, Volume 50, July 2015, Pages 105–116.

⁶⁷ <http://headwaterseconomics.org/tools/economic-profile-system/about/>. Last accessed, July 24, 2016

⁶⁸ Jeffrey B. Jacquet, Ph.D., A Short History of Social Impact Assessment, November, 2014.

http://headwaterseconomics.org/wphw/wp-content/uploads/Energy_Monitoring_SocialImpacts_History.pdf

Over the last several decades, the federal government has invested in programs to address job losses and improve environmental conditions in local areas. BLM should look to, learn from, and improve upon past examples like the watershed restoration and the “Jobs-in-the-Woods Program” from the 1990s and its contemporary incarnations.⁶⁹

Explore changes to revenue sharing statutes to improve community access to funding for local schools and other community priorities. Headwaters Economics and others have proposed changing the formula through which the federal Payments in Lieu of Taxes (PILT) program functions so that the size and relative distribution of federal payments to counties is less directly tied to the specific source of revenue. This would create a framework that can accommodate new dedicated funding streams from public lands from various sources, such as increased fossil fuel royalties, new leasing fees or a carbon tax.⁷⁰ It could also provide more stable funding for local schools in vulnerable communities. Though such an approach would require federal legislation, the PEIS could propose and analyze such an option.

Help communities understand the likely future. As outlined in section IV.I. above, BLM needs to provide an updated “base case” and reasonably foreseeable development scenario for the federal coal program. Such an analysis should include information about expected retirement for coal fired power plants, status of proposed/announced coal mining projects, availability (or lack thereof) of capital for coal mining projects, employment trends, local government revenue sources, and other key factors. It is important for communities to have a realistic understanding of the likely future of the coal industry generally and the market their mines supply specifically.

Provide communities a comprehensive review of tools to help diversify their economies.

This has been helpful for coal-dependent communities—across the country and specifically in the West—to support worker transition and to help communities retooling their economies to become more resilient to changing conditions. These tools include programs targeted at workers and their families to address economic security (such as job retraining programs⁷¹, ensuring health and retirement security), local government (such as providing local infrastructure⁷²), rural

⁶⁹ Christopher E. DeForest, 1999. Watershed restoration, jobs-in-the woods, and community assistance: Redwood National Park and the Northwest Forest Plan. Gen. Tech. Rep. PNW-GTR-449. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 31 p.

http://www.fs.fed.us/pnw/pubs/pnw_gtr449.pdf. Last accessed, July 26, 2016. See also, Ecotrust, “Investing in natural assets for the benefit of communities and salmon” brochure, <http://www.ecotrust.org/media/WWRI-Restoration-Economy-Brochure.pdf> describing current economic benefits of restoration for Oregon communities.

⁷⁰ Testimony of Mark Haggerty, Headwaters Economics March 19, 2013, Senate Energy and Natural Resources Committee Hearing on PILT and SRS Reauthorization and Reform. http://www.energy.senate.gov/public/index.cfm/files/serve?File_id=4cf8ec04-5477-4c03-87f5-b0eb29ea6e26. Last accessed July 24, 2016.

⁷¹ Such as retaining programs in Kentucky (<http://www.jobsight.org/jobseeker/coalminers>) and West Virginia (<http://workforcewv.org/job-seekers/training/laid-off-coal-miners.html>). Last accessed, July 24, 2016.

⁷² For example, see efforts to expand broad band internet access in Colorado’s Delta County. <http://www.region10.net/regional-development/broadband/>. Last accessed, July 24, 2016. See also National Association of Counties’ Coal-Reliant Communities Innovation Challenge. <http://www.naco.org/resources/programs-and-initiatives/coal-reliant-communities-innovation-challenge> and <http://diversifyeconomies.org/>. Last accessed July 24, 2016.

school improvement⁷³, small business support, repurposing mine lands, and infrastructure programs.⁷⁴

Recommendations: BLM should conduct thorough and robust analyses of the current and future economic conditions facing the coal industry in the Western Region, including county-specific analyses for counties with active leases. BLM should also develop a comprehensive review of tools communities can use *now* to help diversify their economies and help workers. Lastly, BLM should identify, propose, and conduct appropriate NEPA analysis of mechanisms through which the Department of the Interior can help communities become stronger and more resilient in the face of rapidly changing economic conditions.

IX. BLM LEGAL AUTHORITIES AND RULEMAKING POWERS

Implicit in much of what has been discussed in these comments is the BLM's strong legal authority to make needed changes to the federal coal program. We provide an overview of that authority below. Specifics of many of the needed changes have been discussed above.

A. BLM Has Broad Authority Under the Mineral Leasing Act and the Federal Land Policy and Management Act.

The BLM has broad authority to modify the federal coal program as needed pursuant to its authority under the MLA and FLPMA. Under the MLA, the Secretary of the Interior has wide discretionary authority to issue coal leases on the federal mineral estate. 30 U.S.C. § 201(a)(1). Prior to issuing coal leases the Secretary is to consider the effects of mining, including, but not limited to, environmental impacts, impacts on agriculture and economic activities, and impacts on public services. *Id.* § 201(a)(3)(C). Leases are to have limited lengths (20 years) and require production of commercial quantities of coal as well as have annual rentals and royalties on coal production, and “such other terms and conditions as the Secretary shall determine.” *Id.* § 207(a). “Prior to taking any action on a leasehold which might cause a significant disturbance of the environment . . . the lessee shall submit for the Secretary’s approval an operation and reclamation plan.” *Id.* § 207(c).

FLPMA sets out a policy that the Secretary is required to “establish comprehensive rules and regulations” for the administration of the public land statutes such as the MLA. 43 U.S.C. § 1701(a)(5). The public lands are to be “managed in a manner that will protect the quality of the scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that where appropriate will preserve and protect certain public lands in their natural condition; that will provide for food and habitat for fish and wildlife . . .” *Id.* § 1701(a)(8). In managing the public lands the Secretary of the Interior “shall, by regulation or otherwise, take any action necessary to prevent unnecessary or undue degradation of the lands.” *Id.* § 1732(b). As already mentioned, it is the policy of the United States under FLPMA that “the

⁷³ See <http://ieefa.org/invest-struggling-coal-industry-communities-let-us-count-ways/>. Last accessed July 24, 2016.

⁷⁴ See also Adele C. Morris, “Build a Better Future for Coal Workers and their Communities,” The Brookings Institution, Washington, D.C., APRIL 25, 2016. <http://www.brookings.edu/~media/research/files/reports/2016/04/25-coal-workers-morris/build-a-better-future-for-coal-workers-and-their-communities-morris-updated-071216.pdf>. Last accessed, July 24, 2016.

United States receive fair market value of the use of the public lands and their resources” *Id.* § 1701(a)9). And, as well, there is a recognition of the need to manage the public lands “in a manner which recognizes the Nation’s need for domestic sources of minerals” *Id.* § 1701(a)(12).

The most fundamental requirement of FLPMA is to manage the public lands for multiple-use and sustained yield. The definition of multiple-use is broad but among other things it requires: (1) management so that the lands “are utilized in the combination that will best meet the present and future needs of the American people;” (2) “the use of some land for less than all of the resources;” and (3) “harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output.” 43 U.S.C. § 1702(c). Sustained yield is management that achieves a high level annual or regular periodic output of renewable resources in perpetuity. *Id.* § 1702(h). The Secretary of the Interior “shall manage the public lands under principles of multiple use and sustained yield” *Id.* § 1732(a).

In addition to managing the public lands to achieve multiple-use and sustained yield, FLPMA includes wide-ranging provisions requiring the development of RMPs to achieve this. 43 U.S.C. §§ 1712, 1732(a). FLPMA also provides that the Secretary “shall issue regulations necessary to implement the provisions of this Act with respect to the management, use, and protection of the public lands” *Id.* § 1733(a). And moreover, the Secretary “with respect to the public lands shall promulgate rules and regulations to carry out the purposes of this Act and of other laws applicable to the public lands” *Id.* § 1740.

Moreover, under both FLPMA and the MLA, the BLM has discretion to issue leases or permit other activities on the federal lands. The MLA explicitly provides that coal leasing will be decided upon by the Secretary of the Interior “in his discretion.” 30 U.S.C. § 201(a)(1). Similarly, FLPMA provides for the agency to decide how public lands are managed “making the most judicious use of the land for some or all of these resources or related services.” 43 U.S.C. § 1702(c). This discretion has been upheld in the face of numerous challenges and is highlighted by the agency in the context of managing mineral leasing. *See, e.g., Wyoming ex rel. Sullivan v. Lujan*, 969 F.2d at 877, 882 (10th Cir. 1992) (“By law that discretion is vested absolutely in the federal government’s executive branch”); *see also Marathon Oil Co. v. Babbitt*, 966 F. Supp. 1024 (D. Colo. 1997); *affirmed* 166 F.3d 1221 (10th Cir. 1999); *cert. denied* 528 U.S. 819 (1999).

The BLM has also highlighted its discretion to authorize uses of the public land in discussing its authority to condition such uses on other actions, including mitigation. BLM’s current mitigation policy provides: “The BLM may expressly condition its approval of the land-use authorization on an applicant’s commitment to perform or cover the costs of mitigation, both onsite and outside the area of impact.” Draft MS-1794 – Regional Mitigation Manual Section, p. 1-6.

Clearly the BLM has wide ranging authority under the MLA and FLPMA to manage the coal program and incorporate needed policy changes through administrative measures, including issuing interim guidance during the pendency of the PEIS process. This authority further

supports BLM's ability to engage in needed rulemaking to implement changes that are found to be needed in the federal coal program as a result of the analysis in the PEIS.

B. BLM Has Additional Authorities as a Landowner.

Another factor that gives the BLM broad authority to protect public lands that are affected by the federal coal program is its status as a landowner—the proprietary owner of the public lands.⁷⁵ It is widely recognized that federal land management agencies derive power to manage the public lands from two sources: Their powers as a sovereign representative of the people, and the powers that all landowners have to control the management of their property.

The BLM acts “in a proprietary capacity” under the MLA. *United States v. Ohio Oil*, 163 F.2d 633, 639-40 (10th Cir. 1947). The Congress has “reserved to the Government the right to supervise, control, and regulate” the development of federal leasable minerals. *Boesche v. Udall*, 373 U.S. 472, 481 (1963). And under the MLA, leased land is subject to “exacting restrictions and continuing supervision by the Secretary.” *Id.* at 477-78. Thus, the BLM is clearly both the manager and the steward of the public lands. And while leasing conveys a right to develop hydrocarbon resources, title to the land remains with the U.S.—the BLM remains the landowner.

Thus, the BLM should recognize its powers as a landowner as it develops plans pursuant to the PEIS, and implements them through any needed rulemaking or through other administrative actions. These proprietary powers as a landowner supplement the powers under the MLA and the FLPMA that have been discussed. These powers are reemphasized in the MLA where it is stated, “[e]ach lease shall contain provisions for the purpose of insuring the exercise of reasonable diligence, skill, and care in operation of said property” and the lease is to be “for the protection of the interests of the United States” and is to be “for the safeguarding of the public welfare.” 30 U.S.C. § 187.

C. Planning 2.0 Will Set Out Additional Direction for Applying BLM's Land Use Planning and Management Authorities.

In addition, the BLM is currently developing new regulations that will govern land use planning. These rules will govern the development, revision, and amendment of RMPs. This process is referred to as “Planning 2.0.” When these new regulations are put in place—likely long before the PEIS is completed—they will provide another source of authority the BLM should consider in developing coal program regulations as well as any needed RMP amendments and revisions. The new planning rules could also affect any needed interim guidance.

The final planning rules will likely require landscape scale planning, not simply planning based at the field office level. Consistent with this direction, the BLM's coal leasing program should be conducted from a national perspective, not a local or even state level perspective, and regional mitigation strategies will be developed at a landscape level, as well. Further, the regulations will likely emphasize the importance of identifying places and values that should be protected and where different types of energy development might be appropriate. The new Planning 2.0

⁷⁵ We recognize of course that the United States is the owner of these lands, but we will refer to the ownership being held by the BLM, the federal agency charged with managing these lands.

regulations will also likely establish procedures for efficiently updating RMPs, including amendments, that will support the actions we recommended to apply suitability and multiple use considerations to leasing availability at the RMP level, as well as to incorporate mitigation plans. The BLM will need to consider the updated planning regulations and follow-on revisions to the agency's Land Use Planning Handbook in terms of overall management approaches and applying protective land designations in the federal coal program.

Recommendations: Given its broad legal power, the BLM clearly has sufficient authority to implement the protective measures and reforms we are recommending for the federal coal program, including those related to updating key elements of the federal coal program, mitigating impacts, and evaluating and addressing climate change impacts. These reforms will ensure that the coal program is conducted in the public interest and achieves a fair market return to the American people.

X. ADDITIONAL DECISIONS TO BE TAKEN.

Based on the recommendations in these comments, the BLM will need to make specific decisions and take specific actions, which will be supported by the analysis in the PEIS and are within the scope of BLM's authority, but may require action outside the PEIS.

A. RMP Amendments.

In order to implement updates to leasing availability decisions and incorporate phased or prioritized leasing, the BLM will have to amend existing RMPs in coal country. As proposed above, the recently approved Buffalo Field Office RMP in the coal-rich Powder River Basin in Wyoming should be a priority for updating through a targeted amendment. The PEIS can amend priority RMPs and also make provision for initiating additional amendments.

In initiating these RMP amendments it will be necessary to consider specific coal mines and the communities adjacent to them. It will also probably be necessary to consider power plants that utilize federal coal to generate electricity. While much of the coal mined in the Powder River Basin is shipped far away, many federal coal mines are near to local power plants. Power plants in the Powder River Basin, the Jim Bridger Power Plant near Rock Springs, Wyoming, and the Craig and Hayden power plants in Colorado are in this category. The PEIS should consider these issues as part of amending these priority plans.

In considering local RMPs and the need for amending them, the BLM should also consider the issue of local community "transition" from the coal industry. This issue has of course been important as the BLM has developed this review and reform of the federal coal program, as discussed in more detail in Section VIII above.

A number of communities, such as Gillette in Wyoming and Paonia and Somerset in Colorado have already been significantly affected by the decline in the coal industry, and there is every likelihood these trends will continue. This may well be true whatever the BLM decides relative to the federal coal program due to the severe economic problems many coal companies are facing. But regardless, the BLM should be sensitive to this issue and seek to assist in rectifying

these problems. In many cases the BLM may not be able to directly address economic and social issues that are impacting a local community—such as reduced employment or the loss of school teachers, for example—but it can, at a minimum, address this issue in the PEIS and seek to enlist the aid of other local, state, and federal agencies that do have the capability, and legal obligation, to address these issues, as discussed in more detail in Section VIII above.

The fundamental decision that will need to be evaluated in all existing RMPs that authorize coal leasing is whether areas are “acceptable for further consideration for leasing.” And if an area subject to updated analysis is found to not be acceptable for leasing, it should be removed from the leasing pool. In particular, areas with high levels of environmental conflict need to be removed from the leasing pool. Accordingly, we recommend BLM set a schedule for completing amendments to update leasing availability for RMPs outside the priority plans for amendment.

B. Interim Guidance Should Be Issued.

In addition to amending RMPs, there is also a need for interim guidance from the BLM to guide coal development during the pendency of the PEIS process.

Under S.O. 3338 provision is made for “exceptions” or “exclusions” from the coal leasing pause. Emergency leasing, lease modifications, lease exchanges, preference right leases, and LBAs where NEPA compliance is complete, including those vacated by judicial decision but undergoing revaluation, are not subject to the pause. These possible continuations of the federal coal development program need to be carefully considered if the PEIS is to be as effective as possible. Therefore, interim guidance—including through Instruction Memoranda—should be issued to carefully define when any of these exclusions might be appropriate. The attempt that has been made to allow for an “emergency lease” at the Alton coal field in Utah is an example of the potential for these exceptions to be controversial.

Interim guidance should also be issued to:

1. Define the “public interest” that governs decisions in the coal program and elaborate on how this can and should be taken into account in evaluating leasing proposals.
2. Require tracking and quarterly reporting of climate emissions;
3. Require development and application of a climate budget, as well as quarterly reporting on actions taken toward achieving the budget;
4. Reiterate the intent and application of the unsuitability criteria and multiple-use considerations and require evaluation of whether proposed leases meet these criteria in the context of the planning area prior to any new leasing;
5. Require that BLM complete and document all 4 steps of the screening process as part of the land use planning process, with an emphasis on ensuring that BLM evaluates the “multiple use considerations” carefully, looking at impacts on land health, species, water, air and protected lands, to determine if conflicts would support making land unavailable and/or specifying required mitigation practices. The policy would also note that the types of “land uses” to be protected by application of the multiple use consideration include the preemption of renewable energy development and other uses that would have the effect of reducing the climate change contribution of the federal lands.

6. Require an enhanced showing of technical and financial capability to qualify for leasing.

C. Rulemakings Should Be Prioritized and Conducted to Implement Reforms.

In addition, the BLM may need to conduct formal rulemakings to incorporate specific reforms. The BLM can conduct needed NEPA analysis to support the rulemakings and make the ultimate processes more efficient. The BLM should commit to completing these rulemakings, set out a schedule, and prioritize the following rulemakings where the agency determines they are needed to fulfill reforms:

1. Update and expand unsuitability criteria;
2. Update royalty, minimum bid, rental rates and reclamation bonding standards;
3. Incorporate a carbon adder into royalty rates;
4. Develop an updated regional coal leasing approach;
5. Shorten lease review terms;
6. Complete Mine Methane Waste Rule.

Recommendations: The BLM has a great deal of legal authority that would allow it to make any changes that are needed to RMPs and to issue any needed interim guidance. It also has full authority to make the various decisions that we have asked for, such as putting in place provisions to reduce the impacts of climate change. The PEIS should recognize the depth of this authority and make decisions from that standpoint.

XI. PURPOSE AND NEED

A fundamental matter that the BLM will have to address during scoping is to define the Purpose and Need for the PEIS. An EIS must contain a statement of the Purpose and Need to which the agency is responding. 40 C.F.R. § 1502.13. As discussed in the first section of these comments, defining the Purpose and Need for an EIS, and thus the alternatives considered in it, is an important aspect of the scoping phase of the NEPA process.

The BLM NEPA Handbook also discusses developing a Purpose and Need statement for an EIS. The BLM feels that the need for a project is often the “underlying problem” that is being addressed. BLM Handbook H-1790-1 at 35. And the purpose of a project is the goal or objective that the BLM is seeking. *Id.* As the BLM recognizes, and as court opinions have emphasized, the Purpose and Need statement cannot be arbitrarily narrow, although the BLM has considerable flexibility in defining the Purpose and Need. *Id.*

The CEQ has determined that “[a]gencies draft a “Purpose and Need” statement to describe what they are trying to achieve by proposing an action.” CEQ *A Citizen’s Guide to NEPA, Having Your Voice Heard* at 16. “The identification and evaluation of alternative ways of meeting the purpose and need of the proposed action is the heart of the NEPA analysis.” *Id.* Thus, it is clear that the BLM should carefully develop the Purpose and Need statement in the PEIS so as to properly identify alternatives for consideration in the PEIS, and ultimately selection of the preferred alternative

Here, it seems clear that a fundamental purpose of the PEIS is to ensure the federal coal program is in alignment with the requirements, goals, and mission of the MLA and FLPMA, and to make changes as needed to meet those objectives. In our view, specific needs could include:

- Ensuring the coal program meets and is conducted in the public interest and provides a net benefit to society.
- Ensuring the public welfare is protected and the public trust responsibility is maintained.
- Ensuring the coal program provides fair market value to taxpayers.
- Ensuring the BLM’s multiple-use mission and goals are met, including addressing issues related to climate change so that the nation’s climate change objectives can be met.
- Providing for a landscape scale analysis that fully considers and manages the pace, scale, location and timing of leasing so that the BLM can best determine how, where and when to lease.
- Ensuring the PEIS is consistent with all existing laws and policies, including current guidance, for mitigation, including mitigation of climate impacts.

We believe that this range for the Purpose and Need statement would be sufficiently targeted to guide development of an appropriate range of alternatives to consider in the PEIS, which we considered above in section VIII, the alternatives section. This range for the Purpose and Need statement would also help ensure that the BLM’s preferred alternative and the proposed action were well based and grounded in the analysis in the PEIS.

Recommendations: The BLM must include a thorough Purpose and Need in the Coal PEIS to guide appropriate development and analysis of alternatives.

XII. CONCLUSION

We would like to thank you for considering these comments. The Wilderness Society looks forward to remaining involved in the BLM’s review of the federal coal program as this NEPA process moves forward, including in a review of the scoping report.

Sincerely,

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Attachment 1. History of the Origins of the Carbon Budget Concept in the Scientific Literature

In 2012, the International Energy Agency, an international organization established to “provide authoritative research and analysis on ways to ensure reliable, affordable and clean energy” for its members,⁷⁶ concluded there is a limit to the amount of fossil fuels that can be developed if the world is to remain within acceptable warming thresholds. Based on an assessment of global carbon reserves, and given existing pollution controls, the agency concluded that “[n]o more than one-third of proven reserves of fossil fuels can be consumed prior to 2050 if the world is to achieve the 2-degree C goal.”⁷⁷

In the fall of 2014, this analysis was expanded and strengthened by the Intergovernmental Panel on Climate Change (Panel). The Panel published a comprehensive synthesis of the latest worldwide scientific consensus on climate change, called the Climate Change 2014 Synthesis Report.⁷⁸ The synthesis describes the recent scientific consensus that there is an overall limit to the amount of carbon dioxide (CO₂) that can be released into the atmosphere to stay within the 2 degree C warming cap.⁷⁹ It calculated that emissions from the year 1870 on would need to be limited to about 2,900 gigatons of CO₂ (GtCO₂) to have a reasonable chance of staying within the cap.⁸⁰ The Panel noted that as of 2011, about 1,900 GtCO₂ had already been emitted.⁸¹ Therefore, the report concluded, to provide better than a 66 percent chance of limiting warming to less than 2 degree C, additional carbon dioxide emissions must be limited to 1,000 GtCO₂.⁸² The Panel also estimated that there are about 3,670 to 7,100 GtCO₂ in proven fossil fuel “reserves” remaining in place,⁸³ which it describes as quantities of fossil fuels “able to be recovered under existing economic and operating conditions.”⁸⁴ As the report notes, this volume of reserves is four to seven times the amount that can be burned to have better than a 66 percent

⁷⁶ International Energy Agency, World Energy Outlook 2012 at 2 (2012), *available at* https://www.iea.org/publications/freepublications/publication/WEO2012_free.pdf.

⁷⁷ *Id.* at 25.

⁷⁸ Intergovernmental Panel on Climate Change (Panel), Climate Change 2014: Synthesis Report (2014), *available at* <http://www.ipcc.ch/report/ar5/syr/>. In fact, a carbon budget has been assessed by the IPCC in all assessment reports (Ciais et al., 2013; Denman et al., 2007; Prentice et al., 2001; Schimel et al., 1995; Watson et al., 1990), as well as by others (e.g. Ballantyne et al., 2012). These assessments included budget estimates for the decades of the 1980s, 1990s (Denman et al., 2007) and, most recently, the period 2002–2011 (Ciais et al., 2013). The IPCC methodology has been adapted and used by the Global Carbon Project (GCP, www.globalcarbonproject.org), which has coordinated a cooperative community effort for the annual publication of global carbon budgets up to the year 2005 (Raupach et al., 2007), 2006 (Canadell et al., 2007), 2007 (published online; GCP, 2007), 2008 (Le Quéré et al., 2009), 2009 (Friedlingstein et al., 2010), 2010 (Peters et al., 2012b), 2012 (Le Quéré et al., 2013; Peters et al., 2013), 2013 (Le Quéré et al., 2014), and most recently 2014 (Friedlingstein et al., 2014; Le Quéré et al., 2015). Each of these papers updated previous estimates with the latest available information for the entire time series. From 2008, these publications projected fossil fuel emissions for one additional year using the projected world gross domestic product (GDP) and estimated trends in the carbon intensity of the global economy (Rogelj, 2016).

⁷⁹ *Id.* at 63.

⁸⁰ *Id.*

⁸¹ *Id.*

⁸² *Id.*

⁸³ *Id.* at 64 Table 2.2.

⁸⁴ *Id.* at Table 2.2 n.f (defining “reserves” and noting that “resources,” by contrast, are quantities of fossil fuels where economic extraction is potentially feasible).

chance of remaining within the 2 degree C warming goal.⁸⁵ One of the expert reports feeding into the Panel’s synthesis explained that to meet “[t]he emissions budget for stabilizing climate change at 2 degree C above pre-industrial levels... only a small fraction of reserves can be exploited.”⁸⁶

The Panel’s synthesis analysis was refined further in January 2015, when the scientific journal *Nature* published a study entitled “The geographical distribution of fossil fuels unused when limiting global warming to 2 degree C.”⁸⁷ The study identifies which fossil fuels must remain undeveloped to improve the chances of remaining below the warming cap. It quantifies the regional distribution of fossil-fuel reserves and resources and, through modeling a range of scenarios based on least-cost climate policies, identifies which reserves and resources could not be burned between 2010 and 2050 if the world efficiently complies with the 2 degree C limit.⁸⁸ It concludes that “a stark transformation in our understanding of fossil-fuel availability is necessary,” because “large portions of the reserve base and an even greater proportion of the resource base should not be produced if the temperature rise is to remain below 2 degree C.”⁸⁹ Thus, expanding on the prior analyses’ conclusion that development of already-existing reserves would far exceed the cap, let alone development of the more speculative category of resources, the study concludes that a commitment to meet the 2 degree C limit would “render unnecessary continued substantial expenditure on fossil-fuel exploration, because any new discoveries could not lead to increased aggregate production.”⁹⁰

⁸⁵ *Id.* at 63.

⁸⁶ Blanco, Gabriel *et al.*, Drivers, Trends and Mitigation, in Climate Change 2014: Mitigation of Climate Change, Working Group III Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change at 251, 380 (2014), available at http://www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_chapter5.pdf.

⁸⁷ McGlade, Christophe and Paul Ekins, *The Geographical Distribution of Fossil Fuels Unused When Limiting Global Warming to 2 °C*, 517 *Nature* (187) (2015).

⁸⁸ *See id.* at 187-90.

⁸⁹ *Id.* at 190.

⁹⁰ *Id.* at 187.

Attachment 2. Selected Major Authorities, Regulations, and Guidance Addressing Mitigation

The Interior Department compiled a list of authorities, regulations, and guidance supporting their efforts to advance mitigation policies in *A Strategy for Improving the Mitigation Policies and Practices of The Department of the Interior: A Report to The Secretary of the Interior from the Energy and Climate Change Task Force*⁹¹ that includes, but is not limited to:

National Environmental Policy Act (NEPA) - 42 U.S.C. §4371 et seq.

NEPA aims to integrate environmental values into decision making by requiring agencies to analyze the environmental impacts of proposed actions that may significantly impact the environment. 42 U.S.C. § 4332(2)(C). Council on Environmental Quality and Department of the Interior regulations implementing NEPA recognize the potential for mitigation to ameliorate impacts of a proposal and require agencies to include in their analyses appropriate mitigation measures not already included in the proposed action or alternatives. 40 C.F.R. §§ 1502.14(f), 1502.16(h); 43 C.F.R. § 46.130. Mitigation is defined broadly, to include means by which impacts can be avoided, minimized, rectified, and reduced, as well as means for compensating for impacts through replacement of resources. 40 C.F.R. § 1508.20. The regulations further require that agency decisions must “[s]tate whether all practicable means to avoid or minimize environmental harm from the alternative selected have been adopted, and if not, why they were not.” 40 C.F.R. § 1505.2(c). CEQ guidance recognizes the importance of mitigation, including the use of mitigation to ensure that impacts of a proposed action will not be significant, along with monitoring and other mechanisms for ensuring that mitigation is implemented, thus enabling agencies to reach a Finding of No Significant Impact (i.e., a “mitigated FONSI”). Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact (January 14, 2011).

Federal Land Policy and Management Act (FLPMA) – 43 U.S.C. § 1701 et seq.

FLPMA requires that the public lands be managed “on the basis of multiple use and sustained yield,” 43 U.S.C. § 1701(a)(7), and “in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resources, and archeological values....” 43 U.S.C. § 1701(a)(8). Under the broad discretion afforded by FLPMA, the BLM can condition uses of the public lands authorized through various instruments (e.g., rights-of-way, permits, licenses, easements, etc.) on the implementation of mitigation measures intended to reduce impacts. The BLM’s recently issued draft mitigation policy provides policy, procedures, and instructions for developing strategies that identify and facilitate regional mitigation strategies, using BLM’s land use planning process to identify potential mitigation sites and measures, and identifying and implementing appropriate mitigation within or outside of the area of impact for particular land-use authorizations. Interim Draft Policy on Regional Mitigation; Manual Section 1794 (June 13, 2013).

⁹¹ Clement, J.P. et al. 2014. A strategy for improving the mitigation policies and practices of the Department of the Interior. A report to the Secretary of the Interior from the Energy and Climate Change Task Force, Washington, D.C.

Mineral Leasing Act (MLA) - 30 U.S.C. § 181 et seq.

The MLA governs leasing of several minerals, most notably oil and gas. The BLM is required, at a minimum, to hold quarterly auctions of oil and gas leases in each state, 30 U.S.C. 226(b)(1). Leases are issued for 10 year terms and may be extended for as long as they produce oil or gas in paying quantities, and include stipulations for reducing impacts of development, Id., 226(e); 43 C.F.R. 3101.1-3. Prior to drilling, operators must file an application for a permit to drill (APD) that, when issued, can require additional measures for mitigating anticipated impacts of development, 30 U.S.C. 226(f), (g).

National Landscape Conservation System (NLCS, Organic Act) - 16 U.S.C. § 7201 et seq.

The NLCS was established “in order to conserve, protect, and restore nationally significant landscapes that have outstanding cultural, ecological, and scientific values for the benefit of current and future generations” and that “The Secretary shall manage the system...in a manner that protects the values for which the components of the system were designated.” Under this direction, the BLM has implemented policy to require mitigation of impacts in order to protect the objects and values for which the units of the NLCS were designated. For example, BLM Manual Section 6100 § 1.6.A.3 describes how “valid existing rights and other non-discretionary uses occurring within NLCS units will be managed to mitigate associated impacts to the values for which these lands were designated”. Similarly, BLM Manual Section 6220 § 1.6.E.5.b describes how “the effects of projects from the grants of the (rights-of-way) must be mitigated” for National Monuments and National Conservation Areas. Additionally, BLM Manual Section 6100 § 1.6.C.5 identifies how NLCS units provide good locations for compensatory mitigation projects.

Endangered Species Act of 1973 (ESA) - 16 U.S.C. § 1531 et seq.

Under Sections 7 and 10 of the ESA, the FWS may recommend means to avoid and minimize the take of listed wildlife species, as well as to establish targeted habitat. Under Section 7, Federal agencies must consult with FWS or National Marine Fisheries Service to ensure that agency actions are not likely to jeopardize the continued existence of a listed species or destroy or adversely modify designated critical habitat. The biological opinion issued by FWS or NMFS includes an incidental take statement, if appropriate, and provides reasonable and prudent measures that must be implemented to minimize the impacts of any anticipated take of listed wildlife species. Where a jeopardy or adverse modification opinion is rendered, reasonable and prudent alternatives will be recommended. Landowners who wish to develop private lands inhabited by listed wildlife species may receive an incidental take permit from FWS under Section 10, provided they have developed an approved habitat conservation plan (HCP), which sets out steps that the permit holder will take to avoid, minimize, and mitigate the impacts on species likely to occur from the proposed action. Off-site mitigation banks often play a key role in meeting conservation requirements under an HCP. Candidate Conservation Agreements, also under Section 10, are voluntary agreements where landowners agree to carry out measures to assist in the conservation of candidate and other at-risk species.

The FWS issued a mitigation policy in 1981 to help the agency make consistent and effective mitigation recommendations to protect and conserve the most important and valuable fish and wildlife resources, while facilitating balanced development of the Nation’s natural resources; U.S. Fish and Wildlife Service Mitigation Policy (46 FR 7644-7663, 1981). FWS has also issued

guidance to help the agency evaluate proposals for establishing conservation banks for the purpose of off-setting adverse impacts to listed species. Guidance for the Establishment, Use, and Operation of Conservation Banks (May 2, 2003). More recently, FWS issued draft guidance that describes a crediting framework for Federal agencies in carrying out recovery of threatened and endangered species. Under the draft guidance, Federal agencies could show how adverse effects of agency activities to a listed species are offset by beneficial actions taken elsewhere for that species, so long as there is a net conservation benefit to the species. Draft Guidance on Recovery Crediting for the Conservation of Threatened and Endangered Species; 72 Federal Register 62258 (November 2, 2007).

Fish and Wildlife Coordination Act (FWCA) – 16 USC § 661-667e.

The FWCA establishes fish and wildlife conservation as a coequal objective of all federally-funded, permitted, or licensed water-related development projects. Under the FWCA, Federal agencies developing such projects must consult with FWS (and NMFS in some instances) and the states regarding fish and wildlife impacts. The statute provides FWS with authority to investigate and prepare reports providing mitigation analyses on all water-related development projects; FWS mitigation recommendations may include measures addressing a broad set of habitats beyond the aquatic impacts triggering the FWCA and species beyond those covered by other resource laws.

National Historic Preservation Act (NHPA) - 16 U.S.C. § 470 et seq.

The NHPA is a procedural statute that requires Federal agencies under Section 106 to take into account the effects of their undertakings on historic properties, and to afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on these undertakings. For the purposes of NHPA, historic properties include properties that are listed in or eligible for listing in the National Register of Historic Places. Through the implementing regulations of Section 106, which are contained in 36 CFR Part 800, “Protection of Historic Properties,” federal agencies are required to consult with State/Tribal Historic Preservation Officers, Indian tribes or Native Hawaiian Organizations, local governments, interested parties such as historic preservation advocacy organizations, the public, and the ACHP. Consultation includes assessing whether or not the undertaking will have adverse effects on such properties and measures to resolve those adverse effects. Section 110(f) specifically addresses mitigation of adverse effects to properties of national significance, requiring that “prior to the approval of any Federal undertaking which may directly and indirectly affect any National Historic Landmark, the head of the responsible Federal agency shall, to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to such landmark.” In many instances, the Section 106 consultation process will result in the execution of a memorandum of agreement, see 36 C.F.R. § 800.6(c), which may include federal agency commitments to avoid or mitigate any adverse effects.

Clean Water Act - 33 U.S.C. § 1251 et seq.

Section 404 of the Clean Water Act provides extensive authority to the U.S. Army Corps of Engineers and the Environmental Protection Agency to conduct mitigation where federal actions impact waters of the United States. The FWS has specific authority under Section 404(m) to secure mitigation for impacts to aquatic resources nationwide. Section 404 (m) requires the Secretary of the Army to notify the Secretary of the Interior, through the FWS Director, when a

permit application has been received or when the Secretary proposes to issue a general permit, and FWS can submit written comments within 90 days. Through its comments, FWS can assist the Corps of Engineers in developing permit terms that avoid, minimize or compensate for permitted impacts. Through its policy on compensatory mitigation related to the National Wildlife Refuge System, FWS has established guidelines for using Refuge lands for siting compensatory mitigation for impacts permitted through Section 404 or Section 10 of the Rivers and Harbors Act. Final Policy on the National Wildlife Refuge System and Compensatory Mitigation under the Section 10/404 Program (64 FR 49229-49234, 1999).

Clean Air Act - §7401, et seq.

The Clean Air Act calls for the prevention and control of air pollution across the country and includes a national goal to “to preserve, protect and enhance the air quality in national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreational, scenic or historic value” (42 U.S.C. §7470(2)). It sets forth an affirmative duty to protect air quality and air quality related values (e.g., visibility and ecosystem resources) of national parks and wilderness areas designated as Class I areas under the statute by avoiding and minimizing impacts to such areas. The Clean Air Act also provides for the banking and trading of emissions reductions and use of emission offsets to capture cost efficiencies. The NPS, BLM, FWS, US Forest Service and the EPA have entered into a memorandum of understanding that adopts a standardized approach that facilitates the completion of NEPA environmental analyses for federal land use planning and oil and gas development decisions and leads to improved design and implementation of mitigation measures that will both protect air quality and air quality related values and provide opportunities for future oil and gas development.

NPS Organic Act of 1916 and General Authorities Act of 1970, as amended - 16 U.S.C. §1, et seq. Under the Organic Act, the National Park Service (NPS) in the Department of the Interior is charged with managing the units of the National Park System so as to “conserve the scenery and the national and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations. Through the General Authorities Act as amended, Congress directed that “the authorization of activities shall be construed and the protection, management and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as many have been or shall be directly and specifically provided by Congress.” These authorities, among others, provide a framework for the Secretary of the Interior to be proactive in protecting the resources and values of the National Park System and for bureaus within the Department to mitigate the impacts of their discretionary activities on the resources and values of park units.

Paleontological Resources Preservation Act (PRPA) - 16 U.S.C. § 470aaa et seq.

This statute states that federal agencies “shall manage and protect paleontological resources on Federal land using scientific principles and expertise.” In areas determined to have high or undetermined potential for significant paleontological resources, the agency must implement an adequate program for mitigating the impact of development, including surveys, monitoring, salvage, identification and reporting, and other activities required by law.

White House Guidance and Initiatives Executive Order (EO) 13604 on Improving Performance of Federal Permitting and Review of Infrastructure Projects (March 28, 2012).

The EO calls for more timely and efficient Federal permitting and review of infrastructure projects while improving environmental and community outcomes. To achieve that objective, the order calls on agencies to integrate reforms into project planning processes “so that projects are designed appropriately to avoid, to the extent practicable, adverse impacts on public health, security, historic properties and other cultural resources, and the environment, and to minimize or mitigation impacts that may occur.”

A Federal Plan for Modernizing the Federal Permitting and Review Process for Better Projects, Improved Environmental and Community Outcomes, and Quicker Decisions (June 2012).

The Plan calls on Federal agencies to identify opportunities to improve mitigation processes by integrating intra- and inter-agency processes and encouraging mitigation planning at the regional, watershed and landscape levels, and to move away from addressing mitigation at the end of project development and on a project-by-project basis.

Presidential Memorandum on Modernizing Federal Infrastructure Review and Permitting Regulations, Policies, and Procedures (May 17, 2013).

The Memorandum recognizes landscape- and watershed-level mitigation practices as means by which agencies have achieved better outcomes for communities and the environment and realized substantial time savings in review and permitting. The Memorandum directs an interagency leadership team to, among other things, expand the use of IT tools to facilitate monitoring of mitigation commitments and “identify improvements to mitigation policies to provide project developers with added predictability, facilitate landscape-scale mitigation based on conservation plans and regional environmental assessments, facilitate interagency mitigation plans where appropriate, ensure accountability and the long-term effectiveness of mitigation activities, and utilize innovative mechanisms where appropriate.”

Implementation Plan for the Presidential Memorandum on Modernizing Infrastructure Permitting (March 2014).

The Plan includes actions to identify policy changes to promote in-advance, landscape-scale mitigation; to facilitate high-quality and efficient permitting and review processes; to identify best practices for early engagement with tribal, state, and local governments; and to expand innovative mitigation approaches that facilitate landscape-level mitigation planning, consistent and transparent standards for applying the mitigation hierarchy, and use of in-lieu fee program and mitigation banks. The overall goal of the plan is to “modernize the Federal permitting and review process for major infrastructure projects to reduce uncertainty for project applicants, reduce the aggregate time it takes to conduct reviews and make permitting decisions by half, and produce measurably better environmental and community outcomes.”

Appendix 1. Key Executive Policies Aimed at Reducing Carbon Emissions from Federal Activities

In the past ten years under two presidents, the White House has issued a number of broad policy announcements aimed at reducing carbon emissions from activities of federal agencies in the form of Executive Orders and associated implementing instructions and guidance. These statements have laid out important targets and timetables for assessing and reducing the government's carbon footprint but have repeatedly failed to include the carbon consequences of development of federally-managed energy resources in the statements and implementing guidance.

This memo summarizes the key policy statements currently in effect, and attempts to assess whether a gap exists in the existing management approach to reducing the carbon emissions from federal activities. Attached is an in-depth look at elements of the Orders.

Summary of Policies

Key policies issued by the White House aimed at reducing the role that the federal agencies themselves play in contributing to climate emissions or reporting on the emissions of federal activities:

Executive Order 13423, Strengthening Federal Environmental, Energy, and Transportation Management, was signed by President Bush on January 24, 2007. This EO instructs Federal agencies to conduct their environmental, transportation, and energy-related activities under the law in support of their respective missions in an environmentally, economically and fiscally sound, integrated, continuously improving, efficient, and sustainable manner. The Order sets goals in several key areas including energy efficiency, power and material acquisition, renewable energy and sustainable buildings.

Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance, was signed by President Obama on October 5, 2009. This EO expanded on the energy reduction and environmental performance requirements for Federal agencies identified in EO 13423. The goal of EO 13514 was "to establish an integrated strategy towards sustainability in the Federal Government and to make reduction of greenhouse gas emissions (GHG) a priority for Federal agencies."

In addition to agency requirements for producing guidance, recommendations, and plans, EO 13514 laid out numerical and non-numerical targets, including 2020 GHG emissions reduction targets Federal Government-wide of 28 percent for *direct* and 13 percent for *indirect* emissions, increasing renewable energy procurement and generation on agency

property and pursuing opportunities with vendors and contractors to reduce GHG emission. EO 13514 also called for specific management strategies to improve sustainability including agency-specific policies and practices to reduce scope of three GHG emissions in agency operations.

EO 13514 was revoked and targets superseded by EO 13693, although much of the implementing guidance remains intact as implementing guidance for relevant provisions in the new EO.

Executive Order 13693, Planning for Federal Sustainability in the Next Decade, was signed by President Obama on March 19, 2015. This is currently the flagship EO related to greenhouse gas performance for the federal government. The EO lays out an aggressive policy statement:

“It is hereby ordered as follows...Federal leadership in energy, environmental water, fleet, buildings, and acquisition management will continue to drive national greenhouse gas reductions and support preparations for the impacts of climate change... Through a combination of more efficient Federal operations such as those outlined in this Executive order...we have the opportunity to reduce agency direct greenhouse gas emissions by at least 40 percent over the next decade while at the same time fostering innovation, reducing spending, and strengthening the communities in which our Federal facilities operate...priority should first be placed on reducing energy use and cost, then on finding renewable or alternative energy solutions... Employing this strategy for the next decade calls for expanded and updated Federal environmental performance goals with a clear overarching objective of reducing greenhouse gas emissions across Federal operations and the Federal supply chain”

This EO replaces several prior orders and policy statements, updating 2020 goals with 2025 goals, as well as clarifying several policy issues. The majority of implementing guidance in place at the agency level will continue to apply but may need to be updated.

The EO creates a government-wide organization and governance structure, including a steering committee, chief sustainability officers in each major agency, regional working groups, and a training. The Order sets a 40% emissions reduction target by 2025 using a 2008 baseline. The Order establishes an energy intensity goal and sets a 25% clean energy target and a 30% renewable energy

target by 2025. None of these targets applies to energy development on public lands.

The EO does require agencies to account for and report emissions from federal activities, but this requirement does not address federal lands energy development. Implementing a provision of the Order (and its predecessor), the Council on Environmental Quality (CEQ) has developed *Guidance on Federal Greenhouse Gas Accounting and Reporting* that establishes government-wide requirements for measuring and reporting greenhouse gas (GHG) emissions associated with Federal agency operations.

Executive Order 13642, Making Open and Machine Readable the New Default for Government Information, was signed by President Obama on May 9, 2013.

The Order declares as a statement of policy that, “Openness in government strengthens our democracy, promotes the delivery of efficient and effective services to the public, and contributes to economic growth.” To improve the discoverability and usability of data assets, the Order requires agencies to develop and Enterprise Data Inventory, which accounts for all data assets created or collected by the agency, and a Public Data Listing, which contains a list of all data assets that are or could be made available to the public. The Order requires agencies to develop protocols for ensuring that the public can directly engage the agency, data are made available to the public wherever possible and, if not, reasons for not releasing data are documented.

Analysis of Current Policies and Implementing Guidance

Although there are several government-wide emissions reduction policies, there are no reduction goals addressing emissions resulting from fossil energy leasing and development.

In-place policies set a GHG reduction goal for federal activities, targets for clean and renewable energy procurement, and requirements for improved building efficiency – but there is no target or even discussion of the carbon consequences of public lands energy development.

Agencies are not required to report on the carbon emissions of fossil energy development at the planning or project permit level, and there is no policy requirement to maintain an inventory of likely emissions from fossil energy resources already under lease. Federal

agencies are required to submit GHG inventories pursuant to the Order. The CEQ has developed government-wide requirements for measuring and reporting GHG emissions associated with federal agency operations. However, the guidance does not require nor recommend reporting on the likely emissions from federal lands fossil fuel development, although such emissions are referenced for possible voluntary reporting. The Interior Department has declined to report on emissions resulting from production, transport or end-use of fossil energy produced from federal lands and waters.

Additionally, CEQ been developing guidance that describes how Federal departments and agencies should consider the effects of greenhouse gas emissions and climate change in their NEPA reviews for individual projects. This *Guidance for Greenhouse Gas Emissions and Climate Change Impacts*, still in draft, explains that agencies should consider both the potential effects of a proposed action on climate change, as indicated by its estimated greenhouse gas emissions, and the implications of climate change for the environmental effects of a proposed action. The guidance also emphasizes that agency analyses should be commensurate with projected greenhouse gas emissions and climate impacts, and should employ appropriate quantitative or qualitative analytical methods to ensure useful information is available to inform the public and the decision-making process in distinguishing between alternatives and mitigations. The current version applies to all proposed Federal agency actions, including land and resource management actions, but has not been finalized and does not provide a standard methodology advanced for estimating the carbon consequences of federal lands energy production.

The existing policy framework supports measuring, disclosing and taking steps to manage the carbon consequences of public lands energy development. The existing policy framework clearly seeks to address all opportunities to improve the environmental performance of federal operations and to enhance access to open data assets describing key federal operations. The absence of policy to address public lands energy development is a gap that represents a blind spot for efforts to credibly ensure the federal government is leading by example.

Conclusion

The government cannot manage what it doesn't measure. While the government has made significant steps to improve the performance of federal activities, there is a fundamental lack of understanding of how much our own management of publicly-owned fossil energy resources contributes to global warming. Existing policies do not address the disclosure, measurement or management of the carbon consequences of global warming—the Obama administration can and should become the first administration in history to acknowledge and address it. A policy commitment to publically measure the carbon impact of fossil fuels on federal lands, including a target to reduce it, is consistent with standing Executive Orders and implementing policies. Including this missing piece will go a long ways towards ensuring that federal lands are put to use as part of a climate solution and not a climate problem.

Table 1. Executive Orders Addressing Federal Agency Greenhouse Gas Emissions

Executive Order	Implementing Instructions	Inventory/Reporting Requirements	Key GHG Reduction Goals	Agency Requirements/ Exceptions
<p>E.O. 13693 (March 19, 2015)</p> <p>Planning for Federal Sustainability in the Next Decade</p>	<ul style="list-style-type: none"> - Implementing Instructions for EO 13693 Planning for Federal Sustainability in the Next Decade of June 10, 2015; - Sustainable Locations for Federal Facilities of September 15, 2011; - Sustainable Practices for Designed Landscapes of October 31, 2011, as supplemented on October 22, 2014; - Federal Greenhouse Gas Accounting and Reporting Guidance [Revision 1] of June 4, 2012; and - Federal Agency Implementation of Water Efficiency and Management Provisions of EO 13514 of July 10, 2013 	<ul style="list-style-type: none"> - Principal agencies (those responsible for the majority of GHG emissions and those managing the federal fleet) are subject to the OMB scorecard process - OMB annually reports on Federal agencies' and departments' progress toward meeting sustainability goals. A Steering Committee meets four times a year to receive and discuss reports 	<ul style="list-style-type: none"> - 40% emissions reductions by FY2025 (FY2008 baseline) for scope 1 and 2 emissions (excluding federal lands energy development) - Continue progress in scope 3 emissions reductions of 13% by FY2020 (off FY2008 baseline) for six types of indirect emissions (excluding federal lands energy development) - 25% of their total facility energy (electric and thermal) is from clean energy sources by 2025. - 30% renewable energy target by 2025 - Reduce energy intensity in Federal buildings by 2.5% per year between 2015 and 2025 (total 25% reduction off FY2015 baseline). - Reduce per-mile GHG emissions from Federal fleets by 30% from 2014 levels by 2025, and increase the percentage of zero emission and plug in hybrid vehicles in Federal fleets. - Relative to the baseline of the agency's building energy use, reduce building 	<ul style="list-style-type: none"> - Agencies submit GHG emissions goal within 90 days of EO (replaces FY2020 targets set under EO 13514) - Established Determining Agency Reduction Targets 2 tool (DART II) to assist agencies in setting targets

Executive Order	Implementing Instructions	Inventory/Reporting Requirements	Key GHG Reduction Goals	Agency Requirements/ Exceptions
			energy intensity by 2.5% through the end of FY2025 - If agency operates fleet of >20 vehicles, they must improve agency fleet and vehicle efficiency by no less than 4% by the end of FY2017	
E.O. 13423 (January 24, 2007) Strengthening Federal Environmental Energy, and Transportation Management	<ul style="list-style-type: none"> - Instructions for Implementing EO 13423 of March 29, 2007 - DOI Departmental Manual 515 DM 4 of August 13, 2008 - USDA Departmental Regulation 1058-001 of January 16, 2009 - BLM Instruction Memorandum 2012-104 of April 24, 2012 - Presidential Memorandum regarding Federal Fleet Performance of May 24, 2011 	<ul style="list-style-type: none"> - Each agency is required to provide compliance data to DOE no later than Dec. 31 of each year, starting with the FY 2007 data and each year thereafter. - Each agency shall implement internal policies that will ensure accurate tracking of vehicle acquisitions. 	<ul style="list-style-type: none"> - Reduce GHGs by 3% annually or 300% by 2015 - Increase alternative fuel consumption at least 10% annually - Reduce petroleum consumption in fleet vehicles by 2% annually through 2015 	<ul style="list-style-type: none"> - All agencies that operate 20 or more motor vehicles with the U.S. must comply with these instructions.
Executive Order 13642 (May 9, 2013) Making Open and Machine Readable the New Default for Government Information	<ul style="list-style-type: none"> - Office of Management and Budget Memorandum M-13-13 of May 9, 2013 	<ul style="list-style-type: none"> - None 	<ul style="list-style-type: none"> - None 	<ul style="list-style-type: none"> - Agencies must develop an Enterprise Data Inventory within six months - Agencies must create a Public Data Listing

<p>Executive Order 13514 (October 5, 2009)</p> <p>Federal Leadership in Environmental, Energy, and Economic Performance</p>	<p><i>Revoked and/or superseded by EO 13693</i></p> <ul style="list-style-type: none"> - Instructions on Implementing EO 13514 Presidential Memorandum on Renewable Energy Target of December 5, 2013 - Presidential Challenge on Performance Contracting of May 24, 2014 	<p>-</p>	<ul style="list-style-type: none"> - 28% reduction by 2020 (2008 baseline) for federal activities for scope 1 and 2 emissions (excluding federal lands energy) - Agencies set emissions reduction targets for FY2020 for two types of GHG emissions (excluding federal lands energy) - Set overall target of 13% reductions in scope 3 emissions by FY2020 (off FY2008 baseline) for six types of indirect emissions: employee commuting, business air travel, business ground travel, transmission, and distribution losses from purchased electricity use, contracted solid waste disposal and contracted waste water treatment 	<p>-</p>
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From: Andrew Emrich
To: BLM_WO_Coal_Program_PEIS_Comments@blm.gov
Cc: [Andrew Emrich](#); [Kristin Nichols](#)
Subject: Cloud Peak Energy Inc.'s Coal Program PEIS Comment Letter
Date: Thursday, July 28, 2016 7:27:21 PM
Attachments: [CPE July 28, 2016 Coal Program PEIS Comment Letter.pdf](#)

Attached is Cloud Peak Energy Inc.'s Coal Program PEIS Comment Letter.

Best regards,

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July 28, 2016

Via Email and U.S. Mail

Mitchell Leverette
Division of Solid Minerals
Bureau of Land Management
U.S. Department of the Interior
20 M St. SE, Room 2134 LM
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[submitted electronically to: BLM_WO_Coal_Program_PEIS_Comments@blm.gov]

RE: Scoping Comments to the Bureau of Land Management Regarding the Programmatic Environmental Impact Statement on the Federal Coal Program

Mr. Leverette:

On behalf of Cloud Peak Energy Inc. ("Cloud Peak Energy"), thank you for the opportunity to provide comments on the scope of the Bureau of Land Management's ("BLM") Programmatic Environmental Impact Statement ("PEIS") on the federal coal program. As a United States coal mining company with almost 100% of its current resources on federal lands in Wyoming and Montana, Cloud Peak Energy is one of the companies that would be most directly impacted by any of the proposed changes to BLM's federal coal program. Please consider the following comments as BLM undertakes its review of the federal coal leasing program in the context of the ongoing PEIS.

There are several fundamental facts that should guide BLM's deliberations going forward:

- ❖ **There is no economic justification for raising royalty rates, lease payments, or any of the other costs or fees related to leasing and developing coal on federal lands.** The domestic coal industry is suffering relentless regulatory and administrative attacks from the current administration and fierce competition from other domestic fuel sources coupled with depressed international prices. These regulatory and economic challenges have led to an unprecedented number of coal company bankruptcies. In 2015, Cloud Peak Energy paid over 33% of its gross annual revenue to federal, state, and local governments in royalties, production-related taxes, rents, and lease payments. At current market prices, these governmental payments on coal production comprise approximately 41% of the sales price for a ton of federal coal. This economic burden is substantially higher than what companies pay to develop non-federal coal in the United States or to develop coal in other countries such as Canada, Australia, India, and China. Under any reasonable metric, coal producers pay much more than their fair share when developing coal from federal lands in the United States.
- ❖ **There is no legal support for making federal coal leasing more difficult and costly.** The statute that governs federal coal leasing on federal lands—the Mineral Leasing Act ("MLA")—encourages federal coal leasing and requires BLM and coal producers with federal leases to achieve maximum economic recovery of the underlying coal estate. Any proposal that makes development of federal coal prohibitively expensive, or which limits coal production to advance other non-statutory goals, is unlawful. The current administration's anti-fossil fuel agenda violates the MLA and 100 years of law and policy encouraging a robust federal coal leasing program as a fundamental means of providing inexpensive and reliable energy to Americans.

- ❖ **BLM recently considered, and rejected as unwise and unlawful, the very changes now proposed in the PEIS.** As recently as 2011, the BLM Director rejected efforts by environmental organizations to substantially revise the federal leasing program and return to a regional leasing system for the Powder River Basin in Wyoming and Montana. BLM explained in 2011 that the current lease by application (“LBA”) process is competitive and ensures that the federal government receives fair market value (“FMV”) for federal coal leases. BLM also explained that the current environmental review process for coal leasing is robust and that BLM has no legal authority to impose any type of “carbon fee” in conjunction with federal lease sales. A challenge to BLM’s decision was rejected by a federal court. In fact, each and every effort by environmental activists over the last five years to substantially change the federal coal program has been uniformly rejected by the federal courts.
- ❖ **No fundamental changes to the federal coal program—including the changes now suggested by the Department of the Interior in the PEIS—were recommended by either the Government Accountability Office or the Inspector General of the Department of Interior.** Both the Government Accountability Office and the Inspector General undertook thorough reviews of the federal coal program in 2013. While both entities made recommendations for improving the *implementation* of the current coal program, neither recommended the substantial changes to the program contemplated in the PEIS.
- ❖ **The Department of the Interior’s current effort to thwart the settled and considered judgment of BLM’s coal leasing professionals is an unwarranted and unlawful effort to advance a narrow anti-fossil fuel agenda at the expense of coal miners and their families, states and local communities, and American energy consumers.** Any attempt to discourage federal coal production would seriously harm the thousands of dedicated coal miners who work to provide reliable, cost-effective energy for America. Such changes would also materially diminish essential revenue for state and local governments.

EXECUTIVE SUMMARY

➤ **BLM’s Review of the Federal Coal Program is Yet Another Unjustified Executive Branch Effort to Shutdown America’s Coal Industry**

BLM’s proposed review of the federal coal program is the latest unjustified attempt by the executive branch to shut down America’s coal industry. The current administration has repeatedly attempted to evade Congress and burden the coal industry through a series of unsound and irresponsible regulatory and administrative actions. Notably, the current administration’s anti-coal political agenda is entirely divorced from the reasoned conclusions of experienced BLM leasing professionals that: (1) the current LBA process prevents speculation and prevents bypass of federal coal reserves; (2) the current LBA application process ensures adequate competition for federal coal; (3) the current environmental review process properly analyzes the environmental impacts of coal leasing; and (4) BLM has no legal authority to impose climate-related fees on federal coal leasing and production. In spite of BLM’s reasoned conclusions, this administration continues to disregard plain statutory directives in an effort to advance a narrow policy agenda that cannot achieve the support of the congressional branch. These efforts call into question the Department of the Interior’s ability to conduct a fair and objective review of the federal coal program.

Even before the conclusion of the public scoping process for the current PEIS, the administration offered answers to some of the very questions for which it ostensibly seeks the public’s input. On June 22, 2016, the White House Council of Economic Advisors issued a report (the “White House Coal Report”) setting forth several conclusions and recommendations related to key questions at issue in BLM’s PEIS. The administration’s predetermination on these important issues has fundamentally undermined the integrity

and objectivity of the NEPA process. See Attachment 1, Letter from Senator Barrasso and 8 Other Senators to Secretary of the Interior Sally Jewell (July 14, 2016). BLM must disavow the White House Coal Report if it intends to retain any semblance of objectivity in the ongoing PEIS process.

➤ **BLM Should Lift the Coal Leasing Moratorium**

Because the executive branch has tainted the ongoing NEPA review through its impermissible predetermination of the outcome of key policy objectives at the heart of that public review, BLM should lift the current leasing moratorium during the pendency of the federal coal program PEIS review. The Department of the Interior has offered no coherent reason why coal producers should be punished by an arbitrary leasing moratorium during BLM's review of the coal program. Similarly, BLM should complete its PEIS process as quickly as possible to avoid lingering uncertainty about the future of the coal leasing program.

➤ **America's Coal Producers Already Pay More than Their "Fair Share"**

In 2015, Cloud Peak Energy paid over 33% of its total revenue to federal and state governments in the form of bonus payments, production-related taxes, and royalties. Put another way, approximately 41% of the current sales price of each ton of federal coal goes to federal, state, and local governments. This is more than a "fair share" of the coal's economic value; especially when all risks associated with production, marketing, and reclamation are taken by the producer. Any increase in the royalty rate would substantially burden U.S. coal companies and frustrate their ability to develop federal coal reserves.

Not only do coal companies need to manage increased costs of labor, increased costs of regulatory compliance, and increased production costs, but they must constantly use current cash flow to invest in lease bonus payments and mining equipment and facilities to ensure the continuation of their business. In an environment where companies such as Cloud Peak Energy must spend such a high percentage of their total revenue on mandatory payments to the federal, state, and local governments, it is no surprise that there has been a significant number of recent U.S. coal company bankruptcies. Cloud Peak Energy is unaware of any other industry in the United States that is forced to operate under such an economic burden.

➤ **BLM Always Receives Fair Market Value For Federal Coal Leases**

Under the current regulatory regime, BLM always receives FMV for federal coal leases. The existing coal leasing program requires that BLM carefully and confidentially determine the FMV of federal coal leases in advance of each lease sale. Pursuant to federal law, BLM must issue the lease to the highest bidder, as long as the bid meets or exceeds the FMV as established by BLM and the bidder satisfies the other legal criteria for holding a federal coal lease. BLM cannot accept any bid unless it meets or exceeds the predetermined FMV. The current bidding process ensures that BLM will always receive at least FMV for each and every federal coal lease, and the strong probability is that BLM will receive more than FMV for each lease.

➤ **BLM Must Honor the Statutory Directives of Congress in Reviewing, and Proposing any Revisions to, the Federal Coal Program**

In reviewing the federal coal program, BLM must comply with the limits imposed by Congress under the MLA and other federal statutes. As it currently stands, many of the contemplated changes to the federal coal program would exceed BLM's statutory directives under the MLA. Prior to making any revisions to the federal coal program, BLM must ensure that each proposed change is consistent with the underlying statutes from which BLM derives its authority.

➤ **BLM Should Retain the Existing Royalty Rate and Other Leasing Costs to Encourage Federal Coal Development in Accordance with the Mineral Leasing Act**

Raising the federal coal royalty rate above 12½ % will discourage leasing and development of federal coal in favor of state or private coal available at a lower royalty rate. Congress has consistently declared that America's energy policy includes the significant development of domestic coal reserves. Congress sought to "encourage the maximum ultimate recovery of the coal deposits in the leasable lands of the United States," by imposing diligent development and maximum economic recovery requirements. *Hearing Before the Subcomm. on Mines and Mining, 94th Cong. 133 (1975)*. The current royalty rates have been established to encourage greater production volume. Raising the royalty rate to discourage federal coal development directly contravenes the congressional mandate to encourage the maximum economic recovery of federal coal. BLM has no legal authority to consider extraneous issues, such as the social cost of carbon, in its maximum economic recovery determination. If the costs of mining federal coal deposits (including royalty rates, lease payments, etc.) become so high that mining the federal coal reserves becomes uneconomical altogether, federal coal will simply not be mined. Raising the federal coal royalty rate to a level that renders the mining of federal coal uneconomical is wholly inconsistent with Congress' directive to the Secretary of the United States Department of the Interior to manage the federal leasing process in order to achieve maximum economic recovery of federal coal.

➤ **BLM Should Retain the Existing Royalty Rate to Prevent a Decrease in the Fair Market Value of Federal Coal Leases**

Increasing the royalty rate will lead to a decrease in the FMV for lease bonus payments. Although the bonus bid and royalty rate are derived from distinct statutory mandates, each cost directly influences the other. BLM's Coal Evaluation Handbook acknowledges that: (1) the royalty rate of the lease influences the amount of economically recoverable coal within a lease tract; and (2) the amount of economically recoverable coal within a lease tract influences the FMV of the lease. Any increase in the royalty rate will decrease the amount of coal that may be recovered economically and depress the FMV of the proposed lease tract.

➤ **BLM Should Not Exceed its Statutory Authority By Increasing Coal Leasing Costs in Furtherance of the Administration's Climate Change Objectives**

Discouraging coal development is clearly the goal of anti-coal activists. However, this objective is contrary to 100 years of federal mineral policy and there is no statutory support for such a radical change. Any attempt by BLM to increase royalty rates or other leasing costs to further the anti-coal agenda would be a clear violation of federal law and policy. The Department of the Interior is not authorized to impose any new or additional taxes, fees, or penalties on coal production. Any effort to raise the royalty rate with the intention of lowering federal coal production volumes to achieve the administration's climate objectives, or promote renewable energy growth, would violate the law. Such efforts would constitute a new revenue measure, which can only be established by Congress.

➤ **BLM Must Conduct Meaningful and Substantive Collaboration with States to Consider Important Socio-Economic Benefits From the Federal Coal Program**

As currently managed, the federal coal program provides significant benefits to the American people. Not only does federal coal production provide substantial revenue to federal, state, and local governments, but it also provides high-paying jobs to hardworking coal miners and other employees in industries tied to coal extraction, transportation, and combustion. The continued leasing and development of federal coal also plays an important role in America's energy portfolio by ensuring a safe, reliable, and cost-effective domestic energy source that provides America with greater energy independence from foreign sources. Any proposed change to the federal coal program that discourages coal production will harm these important domestic interests.

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DISCUSSION

I. Factual Background

A. Cloud Peak Energy and its Mining Operations

1. Cloud Peak Energy's Mining Operations in Montana and Wyoming

Cloud Peak Energy is one of the safest producers of low sulfur, high quality subbituminous coal in the United States. Cloud Peak Energy wholly owns and operates three coal mines on federal leases located in the Montana and Wyoming portions of the Powder River Basin. Cloud Peak Energy operates the Spring Creek Mine in southeastern Montana and the Cordero Rojo Mine and the Antelope Mine in northeastern Wyoming. Cloud Peak Energy's coal mines have been mining and shipping coal since the mid-1970s. Cloud Peak Energy also has two major development projects, the Youngs Creek project and the Big Metal project with the Crow Tribe in the northern Powder River Basin. In 2015, the coal that Cloud Peak Energy produced generated approximately 3% of the electricity produced in the United States. See Cloud Peak Annual Report, at 2 (2015). Cloud Peak Energy is the only Wyoming-headquartered company listed on the New York Stock Exchange (NYSE: CLD).

2. Cloud Peak Energy's Substantial Payments to Federal and State Governments

Through the leasing and mining of federal coal reserves, Cloud Peak Energy is a major contributor of federal lease bonuses, federal rentals and royalties, and state severance taxes and royalties. To obtain and maintain federal leases issued by BLM, Cloud Peak Energy makes a substantial bonus payment at the time of lease issuance and makes annual rental payments and royalty payments thereafter. Between federal bonus payments, royalties, and taxes, Cloud Peak Energy has contributed over approximately \$1.2 billion in governmental payments for the ability to mine federal coal over the last three years, which represents approximately 32.1% of its gross revenues over that three year period.

3. Cloud Peak Energy's Commitment to its Employees and Industry-Leading Safety Record

Cloud Peak Energy employs approximately 1,400 employees who live primarily in Wyoming, Montana, and Colorado. The mining industry and the family wage-jobs created by mining help sustain local communities in this region. Cloud Peak Energy is proud to support its communities, work with local business partners, and purchase goods and services in the region. In 2015, Cloud Peak Energy's expenditures totaled \$136 million in Wyoming and \$52 million in Montana. In addition, its business indirectly supports transportation-related employees, such as rail and port operators.

Cloud Peak Energy is one of the safest coal producers in the nation. During 2015, the Mine Safety and Health Administration data for employee injuries again showed that Cloud Peak Energy's mines collectively had among the lowest injury rates of the 25 largest U.S. coal companies. In 2014, Cloud Peak Energy received the Wyoming Governor's Summit Safety Award in the Large Mine Category presented by the Wyoming Department of Workforce Services, Mines Inspection and Safety Division for the Cordero Rojo Mine. Cloud Peak Energy holds safety as a core value and continues to strive toward a goal of zero injuries.

4. Strong Environmental Stewardship and Responsibility

Cloud Peak Energy has strong programs in environmental stewardship and performance. In 2015, Cloud Peak Energy's Environmental Management System was recertified under the internationally recognized

ISO 14001 standards for the tenth consecutive year. The company continues to be recognized for environmental compliance and initiatives. Most recently, Cloud Peak Energy received the following four awards: (1) the 2012 Good Neighbor Award from the Office of Surface Mining Reclamation and Enforcement (“OSMRE”) for education outreach in environment, reclamation, and mining operations as well as strong support for neighboring communities; (2) the 2013 Wyoming Reclamation Award from the Wyoming Department of Environmental Quality for the sustainable control of cheatgrass at the Antelope Mine; (3) the 2015 Excellence in Surface Coal Mining Reclamation Award at the Cordero Rojo Mine; and (4) the 2015 Wyoming Reclamation Award from the Wyoming Department of Environmental Quality for the successful restoration of the Belle Fourche River at the Cordero Rojo Mine.

B. The Current State of the United States Coal Industry

1. Current Economic Challenges and Economic Burdens on Coal Producers

In recent years, several economic factors have adversely impacted the U.S. coal industry. With the increase of low-priced natural gas, the demand for coal in the United States has declined over the past several years. The U.S. Energy Information Administration (“EIA”) estimates that the use of coal to generate electricity in the United States has decreased 29% between 2007 and 2015. Attachment 2, U.S. EIA, “Power Sector Coal Demand Has Fallen in Nearly Every State Since 2007” (Apr. 28, 2016). In turn, coal production has also declined. According to the EIA, coal production in the first three months of 2016 constituted the lowest levels since the second quarter of 1981. Attachment 3, U.S. EIA, “Quarterly Coal Production Lowest Since the Early 1980s” (June 10, 2016). In the first quarter of 2016, the Powder River Basin saw the largest decline in coal production—in both tonnage and percentage—from the previous quarter. *Id.* Moreover, the U.S. EIA projects that coal production will continue to decrease by more than 100 million short tons in 2016, which would constitute the largest decrease in coal production since the beginning of data collection in 1949. Attachment 4, U.S. EIA, “Short-Term Energy Outlook” (July 12, 2016).

Further, as the demand for coal has decreased over the past half-decade, the costs and burdens associated with coal mining operations have continued to increase. Coal companies must not only manage increased labor costs, increased regulatory compliance costs, and increased production costs; coal companies must also constantly reinvest current cash flow to ensure future production. These costs play an important role in BLM’s maximum economic recovery calculation. As detailed below, BLM’s recently-revised Coal Evaluation Handbook states that maximum economic recovery requires that “the revenue from the sale of each incremental ton of coal must meet or exceed the direct costs to mine, transport, beneficiate, and pay royalty and taxes incurred to produce the next incremental ton of coal mined.” BLM Coal Evaluation Handbook, H-3073-1, at 1-4 (Oct. 2, 2014). Coupled with a decrease in demand, these increased costs work a serious economic burden on the domestic coal industry and threaten to make mining of federal coal uneconomic even under current conditions. The changes contemplated by BLM in its PEIS would only exacerbate this problem.

The table below illustrates the current economic burdens on Cloud Peak Energy (see next page):

Table 1 – Cloud Peak Energy Economic Burdens					
(All \$ in thousands)	2013	2014	2015	Total	3 Year Average
Total Gross Revenue	1,396,097	1,324,004	1,124,111	3,844,212	1,281,404
Total Payments to Federal, State, and Local Governments¹	439,000	423,000	372,000	1,234,000	411,333
Government Payments as a Percentage of Total Gross Revenue	31.4%	31.9%	33.1%	–	32.1%
Net Income (Loss)	51,971	78,960	(204,900)	(73,969)	–

To further illustrate, the following is an illustrative breakdown of the royalties, taxes, and production costs assessed on a single ton of July 2016 Powder River Basin coal:

Table 2 – Taxes, Royalties, and Production Costs Per Ton of PRB Coal	
Spot Price—July 2016 PRB Coal (8800 Btu)	\$8.78
Federal Royalty (12.5%)	(\$1.10)
Abandoned Mine Lands Tax (3.19%)	(\$0.28)
Black Lung Tax (4.21%)	(\$0.37)
Bonus Bid Payment² (11.39%)	(\$1.00)
State Severance Tax (5.24%)	(\$0.46)
County Ad Valorem Tax (4.33%)	(\$0.38)
Total Taxes and Royalties	= (\$3.59)
Illustrative Cash Cost of Production	(\$6.75)
Loss:	(\$1.56)

¹ These amounts represent the accrued federal bonus payments and royalties and production-related taxes, as well as property, sales, and payroll taxes payable on 2013, 2014, and 2015 operations, respectively. This differs from the amounts actually paid in 2013, 2014, and 2015, which would have included payments for operations in other years.

² The bonus bid payment reflects the average bonus bid received on the last ten federal coal lease sales in the southern Powder River Basin from 2008 to 2012.

Finally, the United States government receives a far higher rate of return than any other country involved in the production of coal:

Table 3 – Comparative Global Coal Royalty Rates³		
Country	Surface Royalties	Total Royalties, Taxes, and Other Governmental Fees
Australia	8.2%	8% - 12.5%
India	6.0%	6% - 14%
China	0.5% - 4%	4% - 14%
Republic of South Africa	0.5% - 7%	0.5% - 7%
Colombia	5% - 10%	Less than 10%
Canada	4% - 15%	4% - 15%
United States	12.5% Federal	32% - 42% Federal
	5% - 8% Private	5% - 20% Private

As demonstrated above, the American people have received significant value from the federal coal Cloud Peak Energy has mined and sold without having to invest any capital or take any risks associated with the underlying coal mining business.

Any increase to the royalty rate or other leasing costs would materially exacerbate the economic burden on U.S. coal companies, thereby reducing their viability and frustrating the economic return to the American taxpayer. This fundamentally contradicts the United States' domestic mineral policy over the past 100 years, which has been to ensure that the "next ton" of the resource is developed. BLM must account for current economic realities when assessing the benefits and limitations of the current coal program, and in considering any potential changes to that program.

2. Unprecedented Executive Branch Assaults, Special Interest Lawsuits, and Anti-Fossil Fuel Campaigns Targeting the Coal Industry

In addition to the challenging economic conditions, a number of recently proposed and final federal regulations, and administrative actions, have adversely affected the domestic coal industry. These actions have unfairly targeted and burdened, or threaten to burden, the domestic coal industry and tilted the playing field against coal production and coal-fired electricity generation in favor of coal's economic competitors. Some examples of the Obama administration's unprecedented attempts to burden the domestic coal industry include:

- The Environmental Protection Agency's ("EPA") Final Primary National Ambient Air Quality Standards ("NAAQS") for Nitrogen Dioxide, 75 Fed. Reg. 6474 (Feb. 9, 2010);
- EPA's Final Primary NAAQS for Sulfur Dioxide, 75 Fed. Reg. 35520 (June 22, 2010);

³ Information compiled from the World Coal Association, the National Coal Council, and the National Mining Association.

- EPA's Final Regional Haze Regulations: Revisions to Provisions Governing Alternatives to Source-Specific Best Available Retrofit Technology Determinations, Limited SIP Disapprovals, and Federal Implementation Plans, 77 Fed. Reg. 33642 (June 7, 2012);
- EPA's Final Regulations to Establish Requirements for Cooling Water Intake Structures at Existing Facilities and Amend Requirements at Phase I Facilities, 79 Fed. Reg. 48300 (Aug. 15, 2014);
- The Council on Environmental Quality's ("CEQ") Revised Draft Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act ("NEPA") Reviews, 79 Fed. Reg. 77802 (Dec. 24, 2014);
- Executive Order No. 13693—Planning for Federal Sustainability in the Next Decade, 80 Fed. Reg. 15871 (Mar. 25, 2015);
- EPA's Final Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities, 80 Fed. Reg. 21302 (Apr. 17, 2015);
- EPA's and Army Corps of Engineers' Final Clean Water Rule: Definition of the "Waters of the United States," 80 Fed. Reg. 37054 (June 29, 2015);
- OSMRE's Proposed Stream Protection Rule, 80 Fed. Reg. 42535 (July 27, 2015);
- EPA's Final Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units (the "Clean Power Plan"), 80 Fed. Reg. 64662 (Oct. 23, 2015);
- EPA's Final Standards of Performance for Greenhouse Gas Emissions From New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64510 (Oct. 23, 2015);
- EPA's Final NAAQS for Ozone, 80 Fed. Reg. 65292 (Oct. 26, 2015);
- EPA's Final National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters, 80 Fed. Reg. 72790 (Nov. 20, 2015);
- EPA's Proposed Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS, 80 Fed. Reg. 75706 (Dec. 3, 2015);
- The 2016 Army Corps of Engineer's preemptive and unsupported termination of the permit process for the Gateway Pacific Terminal;
- EPA's Final Rulemaking to Affirm Interim Amendments to Dates in Federal Implementation Plans Addressing Interstate Transport of Ozone and Fine Particulate Matter, 81 Fed. Reg. 13275 (Mar. 14, 2016);
- EPA's Final Supplemental Finding that it is Appropriate and Necessary to Regulate Hazardous Air Pollutants From Coal- and Oil-Fired Electric Utility Steam Generating Units, 81 Fed. Reg. 24420 (Apr. 25, 2016);

- Office of Natural Resource Revenue’s (“ONRR”) Final Consolidated Federal Oil & Gas and Federal & Indian Coal Valuation Reform, 81 Fed. Reg. 43338 (July 1, 2016); and
- EPA’s Final Air Quality Designations for the 2010 Sulfur Dioxide Primary NAAQS, Round 2; 81 Fed. Reg. 45039 (July 12, 2016).

Coal prices are at historic lows due in large part to market distortions caused by regulations and administrative actions issued by the Obama administration. The courts have issued stays against a number of these regulations indicating that they are likely to be ultimately invalidated due to fundamental legal errors.

In recent years, coal producers have faced a barrage of legal challenges from environmental groups whose goal is to destroy America’s coal industry. Some examples of these legal challenges include:

- *WEG v. Salazar*, 783 F.Supp.2d 61 (D.D.C. 2011);
- *WildEarth Guardians (“WEG”) v. Salazar*, 880 F.Supp.2d 77 (D.D.C. 2012), *aff’d*, 738 F.3d 298 (D.C. Cir. 2013);
- *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F.Supp.3d 1174 (D. Colo. 2014);
- *WEG v. BLM*, 8 F.Supp.3d 17 (D.D.C. 2014);
- *WEG v. U.S. Forest Serv.*, 120 F.Supp.3d 1237 (D. Wyo. 2015);
- *W. Org. of Res. Councils v. Jewell*, 124 F.Supp.3d 7 (D.D.C. 2015), *appeal docketed*, 15-5294 (D.C. Cir. Oct. 28, 2015);
- *WEG v. OSMRE*, 2016 WL 259285 (D. Mont. Jan. 21, 2016);
- *W. Org. of Res. Councils v. BLM*, 4:16-cv-21, ECF No. 1 (D. Mont. Mar. 15, 2016); and
- *WEG v. OSMRE*, 104 F.Supp.3d 1208 (D. Colo. 2015), *vacated*, 2016 WL 3410216 (10th Cir. June 17, 2016).

These lawsuits, even when unsuccessful or without merit, have added considerable cost and delay to federal leasing and permitting decisions and have increased the cost and risk of developing coal on federal lands. Moreover, several environmental non-profit organizations have launched anti-fossil fuel campaign initiatives against the coal industry. For example, Sierra Club’s “Beyond Coal” and WEG’s “Keep it in the Ground” campaigns are aimed at eliminating coal production in the United States and forcing the retirement of coal-fired power plants.⁴

⁴ Environmental organizations have also launched full legal assaults against the utility industry, which further harms coal producers and their customers. Some examples include: *Sierra Club v. U.S. Dep’t of Energy*, 825 F.Supp.2d 142 (D.D.C. 2011); *Sierra Club v. Jackson*, 12-cv-705, ECF No. 1 (D.D.C. May 2, 2012); *Sierra Club v. Talen Mont., LLC*, 13-cv-32, ECF No. 1 (D. Mont. Mar 6, 2013); and *Sierra Club v. McCarthy*, 15-cv-1555, ECF No. 1 (D.D.C. Sept. 22, 2015).

3. The Toll on Domestic Coal Producers

The economic, regulatory, and legal challenges facing the coal industry have taken a toll on American coal producers. The current economic environment and regulatory burdens on U.S. coal companies is not sustainable. In the last several years, numerous American coal producers have filed for bankruptcy, including three of the largest coal companies in the country:

- James River Coal (Apr. 2014)
- IBCS Mining (June 2014)
- Bumi Investment (Dec. 2014)
- Bumi Capital (Dec. 2014)
- Enercoal Resources (Dec. 2014)
- Cline Mining Corp. (Dec. 2014)
- Covington Coal Company LLC (Feb. 2015)
- Xinergy Corp. (Apr. 2015)
- Grass Creek Coal Company (Apr. 2015)
- Patriot Coal Corp. (May 2015)
- Birmingham Coal & Coke Company, Inc. (May 2015)
- A&M Coal Company, Inc. (June 2015)
- Walter Energy, Inc. (July 2015)
- Alpha Natural Resources Inc. (Aug. 2015)
- Arch Coal, Inc. (Jan. 2016)
- Peabody Energy (Apr. 2016)

Any increase to the royalty rate or other leasing costs under the existing economic and regulatory conditions is wholly unjustified.

II. The Proposed Coal Program PEIS

On January 15, 2016, Department of the Interior Secretary Sally Jewell issued Secretarial Order No. 3338, which directs BLM to prepare a discretionary nation-wide PEIS to evaluate the environmental impacts associated with the existing federal coal program. The PEIS purports to undertake “a comprehensive review of the [federal coal] program and consider whether and how the program may be improved and modernized to foster the orderly development of BLM administered coal on Federal lands in a manner that gives proper consideration to the impact of that development on important stewardship values, while also ensuring a fair return to the American public.” Secretarial Order No. 3338, Sec. 1 (Jan.

15, 2016). On March 30, 2016, BLM published in the Federal Register a “Notice of Intent to Prepare a [PEIS] To Review the Federal Coal Program and To Conduct Public Scoping Meetings.” See 81 Fed. Reg. 17720 (Mar. 30, 2016). The notice highlighted several specific issues which the Department of the Interior intends to consider:

- *How, When, and Where to Lease.* BLM proposes to consider: (1) whether and how to revise the regional leasing and LBA processes, which is the current regulatory framework for coal leasing on public lands; (2) when to issue coal leases, including whether scheduled sales for federal coal are appropriate; and (3) whether BLM’s unsuitability criteria is sufficient to identify where to authorize coal leasing on public lands. *Id.* at 17725.
- *Fair Return on Federal Coal.* BLM proposes to consider whether existing bonus bids, rental payments, and royalties received under the federal coal program constitute a fair return to the American public on federal coal and, if not, changes to the federal coal program to ensure a fair return. *Id.*
- *Climate and Other Impacts.* BLM proposes to examine how to address and assess climate change impacts related to federal coal production, transportation, and combustion, including potential substitution effects, unnecessary and undue degradation of lands, mitigation, and other considerations. *Id.* In addition, BLM will evaluate other potential impacts from the federal coal program on public health and the environment. *Id.* at 17725-26.
- *Socio-Economic Impacts.* BLM proposes to evaluate whether the federal coal program accurately accounts for externalities related to coal production, such as environmental and social impacts. *Id.* at 17726. In particular, BLM will consider how the federal coal program impacts regional and national economies, jobs, and energy markets. *Id.*
- *Exports.* BLM proposes to consider whether and how coal leasing decisions should account for actual or projected exports of domestic coal, including an appropriate mechanism for determining coal export potential in leasing decisions. *Id.*
- *Energy Needs.* BLM proposes to consider how the production of federal coal impacts the energy needs of the United States. *Id.* In particular, BLM will assess how federal coal production impacts electricity generation in the United States. *Id.*

Cloud Peak Energy provides the following scoping comments and discussion for BLM’s consideration as BLM undertakes its PEIS analysis. Cloud Peak Energy’s comments are divided into three main parts. First, Cloud Peak Energy provides general, overarching comments and concerns related to BLM’s review of the federal coal program in Section III. Second, in Section IV, Cloud Peak Energy provides comments in response to the specific issues identified by BLM as part of the scoping process. Third and finally, in Section V, Cloud Peak Energy provides specific recommendations for BLM’s consideration as it proceeds with preparation of the PEIS.

III. Cloud Peak Energy’s Over-Arching Comments and Recommendations

A. BLM and Federal Courts Have Recently and Consistently Rejected the Need to Overhaul the Federal Coal Program

Although Secretarial Order No. 3338 now directs BLM to prepare the nation-wide PEIS, BLM has recently expressed its unwavering position that a significant overhaul of the federal coal program is unnecessary. As an initial matter, neither the MLA, NEPA, or any other statute compels BLM to perform supplemental environmental analysis with respect to the existing coal program or to modify the current program. Even

the Secretary admits that BLM has no affirmative or mandatory obligation to conduct programmatic review of the federal coal program. See Secretarial Order No. 3338, Sec. 4 (Jan. 15, 2016) (directing BLM to perform a “[d]iscretionary” programmatic review of the federal coal program). More importantly, in the context of rejecting an administrative petition to overhaul the federal coal program in Wyoming and Montana, and the extensive federal court litigation that followed this decision, BLM has flatly rejected any contemplated overhaul of the federal coal program as both unwarranted and unlawful. The recent attempts by environmental groups to compel BLM’s modification to the federal coal leasing program have been uniformly rejected by BLM and two federal judges in three separate legal decisions.

In July 2010, WEG and a host of other environmental organizations challenged BLM’s issuance of two large coal leases in the Wyoming portion of the Powder River Basin. See *WEG v. Salazar*, 783 F.Supp.2d 61, 62 (D.D.C. 2011). In addition to raising its typical NEPA claims related to environmental impacts from coal leasing and production, WEG also alleged that BLM’s decertification of the Powder River Basin was invalid, despite the fact that BLM had decertified the region more than twenty years ago. BLM defended its authority to determine whether and when to certify or decertify coal production regions under its existing regulations and the MLA. *WEG v. Salazar*, 10-cv-1174, ECF No. 53-1 at 10 (D.D.C. Dec. 29, 2010) (the MLA “makes no mention of certifying, decertifying, or recertifying coal production regions, nor does it provide any standards for determining whether a given area must be certified or recertified”). As such, BLM argued that its decertification of the Powder River Basin under the existing regulatory scheme was proper and that it had no obligation to recertify the Powder River Basin. *Id.* at 11-12. The district court agreed with BLM and concluded that BLM had no affirmative obligation to recertify coal production regions under existing regulations or the MLA. *WEG v. Salazar*, 783 F.Supp.2d at 69-75.

In another legal challenge, BLM’s decision not to amend the existing federal coal program was addressed by the federal District Court for the District of Columbia. In 2011, WEG again attempted to compel BLM to prepare an environmental analysis related to the coal leasing program. *WEG v. Salazar*, 859 F.Supp.2d 83, 90 (D.D.C. 2012). This time WEG requested that BLM recertify the Powder River Basin as a coal production region under BLM’s regional leasing process. The recertification of the Powder River Basin as a coal production region would have required BLM to perform an extensive analysis of the environmental impacts related to coal leasing in the region. Again, BLM rejected WEG’s petition for changes to the federal coal program. In doing so, BLM concluded that the LBA process: (1) “provides coal reserves for leasing at a level approximately equal to the depletion by mining thereby assuring an optimum return to the public;” (2) “has effectively prevented speculation and bypass of Federal coal resources;” and (3) “supports competition for Federal coal leases.” Attachment 5, BLM Petition Denial, at 8 (Jan. 28, 2011). BLM also explained why the agency’s current environmental analysis for federal coal leasing satisfied NEPA and was consistent with the current state of climate science. *Id.* at 5-7. Ultimately, WEG’s challenge to BLM’s petition denial decision was dismissed. *WEG v. Salazar*, 859 F.Supp.2d at 88.

Most recently, the District Court for the District of Columbia expressly held that BLM had no duty to supplement existing NEPA analysis to assess potential federal coal program reform. In November 2014, the Western Organization of Resource Councils and other environmental organizations circumvented BLM and sought immediate review in federal court concerning BLM’s obligation to reform the federal coal program. The environmental organizations argued that BLM violated NEPA by failing to complete supplemental environmental impact analysis to consider climate change impacts. *W. Org. of Res. Councils v. Jewell*, 124 F.Supp.3d 7, 11 (D.D.C. 2015). Yet again, BLM rejected the notion that it was obligated to reform the federal coal program. BLM rightly maintained that it had no mandatory duty to perform a programmatic EIS. See *W. Org. of Res. Councils v. Jewell*, 14-cv-1993, ECF No. 13-1 at 9-12 (D.D.C. Jan. 31, 2015). The district court agreed and held that BLM was not required to conduct a

programmatic EIS in the absence of a proposal to amend the existing regulatory scheme. *W. Org. of Res. Councils v. Jewell*, 124 F.Supp.3d at 13.⁵

In the face of BLM's recent rejections of calls by environmental groups to overhaul the federal coal program, and federal court decisions unanimously affirming BLM's decisions, Secretarial Order No. 3338 represents an unnecessary and unsupported administrative "about-face." There is simply no legal justification for the Department's current proposal to substantially modify the federal coal leasing program.

B. There is No Policy Rationale for Change to the Federal Coal Program

Despite the Secretary's change in positions and sudden assertions in Secretarial Order No. 3338 regarding the necessity of federal coal program reform, BLM has no legitimate policy justification for doing so. In fact, the recent comprehensive reviews of the federal coal program do not support the need for policy revisions, including increased royalties or other costs related to coal leasing. In June 2013, the Inspector General of the Department of the Interior published a report entitled "Coal Management Program, U.S. Department of the Interior" (the "IG Report"). In December 2013, the Government Accountability Office issued a report entitled "BLM Could Enhance Appraisal Process, More Explicitly Consider Coal Exports, and Provide More Public Information" (the "GAO Report").

Neither the GAO Report nor the IG Report contain any indication of systemic undervaluation of federal coal due to royalties or widespread undervaluation of coal offered for leasing. Rather, the identified deficiencies stemmed from BLM's own failure to properly implement and enforce its existing regulatory program. For example, the reports identified several implementation issues, such as BLM's failure to employ consistent methodologies for determining the FMV of federal coal leases, the lack of independent third-party review for FMV determinations, and insufficient implementation of enforcement procedures. See, e.g., IG Report at 14 (addressing the coal inspection and enforcement program); GAO Report at 30-36 (discussing the lack of third-party review in calculating the FMV determination). BLM cannot point to a single recommendation from either the GAO Report or IG Report to support a proposed increase in royalty rates or leasing costs for federal coal. The recommendations proposed by the GAO Report and IG Report do not justify an overhaul of the federal coal program or raising coal leasing costs.

To the contrary, the reports provided several recommendations to improve BLM's implementation and management of the current federal coal program, such as better coordinating with the Department of the Interior's Office of Valuation Services to determine the FMV of proposed federal coal tracts and ensuring consistent implementation of the coal leasing process across all BLM offices. See GAO Report at 28-36. Before proceeding with its proposed changes to the federal coal program, BLM should first evaluate the Department of the Interior's progress in implementing the recommendations in the GAO Report and IG Report.

C. BLM's Proposed Imposition of Higher Royalties on Coal Leasing and Development Violates the Congressional Mandate Under the Mineral Leasing Act to Encourage the Maximum Economic Recovery of Federal Coal

BLM proposes to consider changes to the federal coal program which contravene the congressional mandate under the MLA to obtain maximum economic recovery and encourage the development of federal coal resources. For example, BLM intends to consider "rais[ing] the royalty rate [and]

⁵ The environmental plaintiffs appealed the district court's ruling before the District of Columbia Circuit Court of Appeals. The appeal is currently pending and on June 14, 2016, the appeal was placed in abeyance pending completion of the ongoing PEIS. See *W. Org. of Res. Councils v. Jewell*, Case No. 15-5294, Doc. No. 1619174 (D.C. Cir. June 14, 2016).

limit[ing] the use of royalty rate reductions.” 81 Fed. Reg. at 17726. To do so would contravene clear and long-standing congressional direction under the MLA.

Since the enactment of the MLA, Congress has consistently declared this Nation’s policy to be that of encouraging the development of domestic coal reserves through the federal leasing process. See H.R. Rep. No. 17, pt. 1, at 3 (1916) (“The leasing system and the intelligent utilization of the coal . . . [is] imperative”); see also Mining and Minerals Policy Act of 1970, 30 U.S.C. § 21a (“Congress declares that it is the continuing policy of the Federal Government in the national interest to foster and encourage private enterprise in . . . the orderly and economic development of domestic mineral [coal] resources.”); Federal Land Policy and Management Act of 1976, 43 U.S.C. § 1701(a)(12) (“[I]t is the policy of the United States that . . . the public lands be managed in a manner which recognizes the Nation’s need for domestic sources of minerals.”).

Further, through the Federal Coal Leasing Act Amendments of 1976, Pub. L. 94-377, 90 Stat. 1083 (“FCLAA”), Congress sought to “encourage the maximum ultimate recovery of the coal deposits in the leaseable lands of the United States,” by imposing diligent development and maximum economic recovery requirements. See *Hearing Before the Subcomm. on Mines and Mining*, 94th Cong. 133 (1975). Consistent with Congress’ purpose to encourage maximum economic recovery of coal deposits, the MLA requires that “[p]rior to issuance of a lease, the Secretary shall . . . [ensure] the maximum economic recovery of the coal within the proposed leasing tract.” 30 U.S.C. § 201(a)(3)(C). Moreover, the MLA mandates that “[e]ach lease shall be subject to the conditions of diligent development.” *Id.* § 207(b)(1).

The Secretary’s determination of whether maximum economic recovery will be achieved is based on the economics of developing the particular coal reserve. See 43 C.F.R. §§ 3480.0-5(21), and 3484.1(b). The Secretary must consider the direct costs the lessee incurs in mining the reserve, with consideration given to “existing proven technology; commercially available and economically feasible equipment; coal quality, quantity, and marketability; safety, exploration, operating, processing, and transportation costs.” *Id.* § 3480.0-5(21); see also *id.* §§ 3482.1(c) and 3487.1(c) (listing the information informing the Secretary’s maximum economic recovery determination).

With regard to royalties, the royalty rate of a federal lease is a direct cost the Secretary must consider in making a maximum economic recovery determination. Current regulations governing maximum economic recovery provide that “*profitable* portions of a leased Federal coal deposit must be mined.” *Id.* § 3480.0-5(21) (emphasis added). The royalty rate on the federal coal directly influences the coal’s profitability. BLM’s revised Coal Evaluation Handbook recognizes the connection between the royalty rate and maximum economic recovery:

[Maximum economic recovery] is an economic test based on when the direct mining, beneficiation, and royalty and tax costs for producing the next unit of coal into a marketable condition, are equal to the value derived from the sale of the same unit of coal. Said another way, the revenue from the sale of each incremental ton of coal must meet or exceed the direct costs to mine, transport, beneficiate, and pay royalty and taxes incurred to produce the next incremental ton of coal mined. [Maximum economic recovery] is achieved at the point where economically recoverable reserves become uneconomical.

Coal Evaluation Handbook, H-3073-1 at 1-4 (Oct. 2, 2014). If the royalty rate is increased and becomes so high that mining the leased federal coal deposit becomes uneconomical, the coal will not be mined. Raising the federal lease royalty rate to a rate that renders the mining of federal coal less economical is wholly inconsistent with Congress’ intent and the Secretary’s duty to achieve maximum economic recovery of coal through the leasing process.

The issue of high royalty rates and resulting waste of coal resources was addressed by Congress in 1975. See *Hearing Before the Subcomm. on Mines and Mining*, 94th Cong. 16 (1975). In evaluating whether federal coal leases should be awarded through a royalty bidding process, Congress found that if the royalty bidding process led to a “very high royalty,” “vast tons of Federal resources, coal resources, [would] simply [not] be developed” because it would be unprofitable for the lessee. *Id.*; see also *id.* at 38 (“[If] royalty rates [are] so high that total mining costs would be excessive for a lease . . . economic mining methods might not be possible and early abandonment of the lease for that reason could be likely with attendant waste of mineral resources.”). For this reason, Congress ultimately adopted the current bonus bidding process with a fixed royalty rate. See 30 U.S.C. §§ 201, 207. Imposing a high royalty rate now would lead to the precise outcome Congress sought to avoid in 1975.

The federal coal royalty rate is remuneration to the Government for the minerals produced. 53 Cong. Rec. 835, 839 (1916); *Hearing Before the Subcomm. on Mines and Mining*, 94th Cong. 23 (1975). In 1920, royalty on coal under the MLA was based on a cents per ton calculation that had little to do with the value of the coal. 41 Stat. 437, 439 (1920) (royalty for coal “shall not be less than 5 cents per ton of two thousand pounds”). In 1970, the bipartisan Public Land Law Review Commission published a Report recommending that the royalty rate on production of minerals from public lands, including coal, should instead be based on “fair-market value.” *One Third of the Nation’s Land: A Report to the President and to Congress by the Public Land Law Review Commission* at 128 (June 1970). For royalty setting purposes, the FMV must be competitive with the market value of coal mined from state or private leases. See *id.* at 129 (“The proportion of value should be comparable, but not necessarily equal, to rates being paid to other landowners for the same mineral ore in the region.”). In addition, the Report concluded that “Congress should specify such royalties at levels that will provide a **continuing incentive for mineral exploration, development, and production on public lands.**” *Id.* (emphasis added).

Through the FCLAA, Congress changed the royalty for coal to a percentage of its value. H.R. Rep. No. 94-681, 24 (1975) (“the revised language changes the minimum royalty from \$.05 per ton to twelve and one half per centum of the value of the coal, except that the Secretary may determine a lesser amount for underground mining operations”). As a result, since 1976, the federal royalty rate has been set at a level to provide a fair return to the United States based on the FMV of the coal. By raising the costs associated with the production of federal coal, including imposed indirect environmental costs or increased royalty rates, BLM will discourage future leasing and production on federal lands. It has been made abundantly clear through BLM’s coal listening sessions, purchased media, and historic comments that opponents of the coal industry seek to discourage coal production on federal lands. However, the outcome sought by coal industry opponents contradicts 100 years of federal mineral policy, and there is no statutory support for such a radical change. Any attempt by BLM or the Secretary to increase royalty rates in order to decrease coal development on federal lands would be a clear violation of federal law.

D. BLM Lacks Authority to Impose Additional Costs on Coal Leasing and Development under the Mineral Leasing Act

In addition to increased royalty rates, BLM intends to consider the imposition of other costs on federal coal leasing and production. For instance, BLM will evaluate “the Nation’s climate objectives, as well as the Nation’s energy and security needs,” in considering federal coal program reform. 81 Fed. Reg. at 17725. BLM, however, lacks authority under the MLA, or any other statute, to restructure the federal coal program to address the social cost of carbon or impose other costs related to climate change.

The Secretary is not authorized under the MLA to impose any new or additional taxes, fees, or penalties on coal production, including any fees related to indirect environmental considerations. The Secretary’s rulemaking authority under the MLA is limited to promulgating regulations “necessary to carry out and accomplish the purposes of this chapter [the MLA leasing provisions.]” 30 U.S.C. § 189. As detailed above, the purpose of the MLA’s leasing provisions is to encourage coal development, not render it

uneconomical or undesirable. Any effort to impose additional costs on coal leasing and development with the intention of lowering federal coal production volumes to achieve the administration's climate objectives, or promote renewable energy growth, is not an authority granted to the Secretary under the MLA or any other federal statute. The imposition of new revenue measures must be initiated and voted on by Congress. See *Meriwether v. Garrett*, 102 U.S. 472, 501 (1880) ("The power of taxation is legislative, and cannot be exercised otherwise than under the authority of the legislature.").

This lack of authority extends to any attempt by the Department of the Interior to utilize the social cost of carbon, or similar analytical tools, to further burden coal leasing on public lands through indirect taxation or mitigation. In other words, BLM has no authority to discourage coal mining at the leasing stage based on downstream effects, such as greenhouse gas emissions from transportation and combustion, using the social cost of carbon or any other similar analytical method. Even BLM has previously recognized that the imposition of climate-related costs "is outside the scope of [the Federal Land Policy and Management Act] and the MLA." See Attachment 5, BLM Petition Denial (Jan. 28, 2011) ("Carbon and any other fees dedicated to raising monies to fund other initiatives would require legislation allowing that authority to the BLM.").

As another example, an attempt to impose and collect royalties on services provided by affiliated logistics businesses exceeds BLM's authority under the MLA. The Department of the Interior and the current administration has advocated for the imposition of royalties on transportation costs, such as those costs typically incurred by the buyer. In fact, the White House Council of Economic Advisers recently issued the White House Coal Report, which in effect proposes federal royalty collection on the value of services provided by vertically integrated companies such as Cloud Peak Energy's logistics business, in addition to coal production. White House Coal Report, at 18-19 (June 22, 2016). The White House Coal Report fails to acknowledge the additional, substantial, costs, required investments, and business risks associated with delivering coal to distant locations. See *Norwest Corporation, "Federal Coal Leasing Moratorium: An Examination of the Reasons Driving a Disruptive Policy,"* at 4-1 to 4-5 (July 28, 2016). However, the imposition of royalties on two separate transactions (the production and transportation of federal coal) is clearly inconsistent with congressional direction under the MLA, as amended by the FCLAA, which provides that federal royalties for coal must be calculated based upon the coal's value "at the mine."

When a federal royalty is based on the value of the mineral, it has always been based on the value of the mineral "at the mine." When the MLA was first enacted, the royalty on most minerals (but not coal) was set as a percentage of the value of the mineral. See, e.g., 41 Stat. 437, 443 (1920) (royalty for oil and gas "shall not be less than 12 1/2 per centum in amount or value of the production"). For the value-based royalties, the legislative history is replete with evidence that Congress and the Department of the Interior intended the value to be determined "at the mine." For example, for federal phosphates and phosphate rock reserves, the legislative history provides that value is based "at the mine." See, e.g., 53 Cong. Rec. 1098 (1916) (royalties shall be based on "the gross value of the output of phosphates or phosphate rock at the mine"); H.R. Rep. No. 17, 11 (1916) (Secretary Lane's report provides that phosphate royalty should be based on "the gross value of the output at the mine"); 58 Cong. Rec. 4055 (1919) ("the gross value of the output of phosphates or phosphate rock at the mine"). The MLA legislative history is the same for potassium and sodium. See, e.g., H.R. Rep. No. 17, 8 (1916) (potassium or sodium royalty is based on "the value of the output at the point of production").

In 1920, royalty on coal under the MLA was based on a cents per ton calculation that had little to do with the value of the coal. 41 Stat. 437, 439 (1920) (royalty for coal "shall not be less than 5 cents per ton of two thousand pounds"). It was not until the FCLAA that Congress changed the royalty basis for coal to a percentage of its value. H.R. Rep. No. 94-681, 24 (1975) ("the revised language changes the minimum royalty from \$.05 per ton to twelve and one half per centum of the value of the coal, except that the Secretary may determine a lesser amount for underground mining operations").

When Congress adopted a value-based royalty for coal, Congress reiterated its intent that when the royalty is based on the value of the mineral, the value is determined “at the mine.” The legislative history for the FCLAA amendments regarding advance royalty payments provides that standard royalty rates are based on “the gross value of the coal at the mine.” See S. Rep. No. 94-296, 49 (1976). One year after the FCLAA was enacted, Congress passed the Abandoned Mine Reclamation Fund, Pub. L. 95–87, 91 Stat. 445 (1977), which is administered by the Secretary of the Interior and imposes a reclamation fee on all coal mines. The fee is assessed as a percentage of “the value of the coal at the mine.” 30 U.S.C. § 1232.

Consistent with legislative directives, courts since the 1940s have held that the government’s royalty interest is limited to the value of production at the mine. *United States v. Gen. Petroleum Corp. of Cal.*, 73 F.Supp. 225, 258 (S.D. Cal. 1946) (gas royalty obligation is determined “at the leases, that is before it left the field”), *aff’d sub. nom. Cont’l Oil Co. v. United States*, 184 F.2d 802, 820 (9th Cir. 1950) (“royalties were to be calculated at values at the wells, not at the . . . destination”); *Indep. Petroleum Ass’n of Am. v. Armstrong*, 91 F. Supp. 2d 117, 119 (D.D.C. 2000) (“the essential bargain embodied in federal and Indian leases entitled the lessor to a royalty based upon the value of production at the lease”).⁶

Further, courts have consistently invalidated any Department of the Interior regulation or policy that is contrary to the MLA’s intent. See, e.g., *Plateau, Inc. v. Dep’t of Interior*, 603 F.2d 161, 164 (10th Cir. 1979) (invalidating regulation governing federal royalty oil because, based on legislative history, the court found the regulation “goes beyond what Congress authorized”); *Marathon Oil Co. v. Andrus*, 452 F.Supp. 548, 552-53 (D. Wyo. 1978) (invalidating agency oil and gas royalty policy as conflicting with “the legislative history of the [MLA], together with its many enactments and re-enactments”); *Indep. Petroleum Ass’n*, 91 F. Supp. 2d at 125 (invalidating MMS regulation which disallowed transportation deduction for unused pipeline firm transportation charges, which MMS claimed were not “actual” costs incurred to move gas downstream, because the disallowance led to a definition of “value” inconsistent with the MLA’s intent that royalty should be based at the lease), *rev’d on other grounds*, 279 F.3d at 1042-43.

In fact, a federal court recently rejected an attempt by BLM to circumvent the limits on its congressionally-delegated statutory authority through the rulemaking process. On June 21, 2016, federal District of Wyoming Judge Scott W. Skavdahl invalidated BLM’s recent promulgation of a regulation related to hydraulic fracturing. See *State of Wyoming, et al. v. Dep’t of the Interior*, 2016 WL 3509415, at *11-12 (D. Wyo. June 21, 2016), *appeal docketed*, No. 16-8069 (10th Cir. June 29, 2016). In invalidating BLM’s hydraulic fracturing rule, the court emphasized an important principle of administrative law: “It is axiomatic that an administrative agency’s power to promulgate legislative regulations is limited to the authority delegated by Congress.” *Id.* at *3 (quoting *Bowen v. Georgetown Univ. Hosp.*, 488 U.S. 204, 208 (1988)). The same administrative principle applies to BLM’s revision of the federal coal program. Here, BLM’s attempt to assess royalties or impose additional costs on an entirely separate economic transaction that is wholly unrelated to mining, as reiterated in the recent White House Coal Report, would similarly contravene congressional intent. As such, BLM must disavow the report in its entirety.

Cloud Peak Energy requests that BLM ensure that any changes to the federal coal program comport with BLM’s statutory mandates under the MLA. Specifically, BLM should not consider any changes to the federal coal program which would restrict, diminish, or penalize coal production on federal lands by raising leasing and production costs or otherwise making federal coal reserves economically

⁶ Although these cases involve royalty on oil and gas, the stated principles are equally applicable to coal royalty valuation. See *Black Butte Coal Co. v. United States*, 38 F.Supp.2d 963, 971 (D. Wyo. 1999) (“Simply because [prior cases] involve gas and oil as opposed to coal is not a compelling reason to ignore them. The decisions’ discussion of the assessment of royalties is functionally indistinguishable . . .”).

unrecoverable. The scope of BLM's programmatic review must not contravene the Secretary's authority to obtain maximum economic recovery of federal coal.

E. BLM Must Collaborate With, and Consider Impacts to, States and America's Coal Producers in Preparing the Coal Program PEIS

BLM must engage in meaningful collaboration with both states and America's coal producers in order to fully consider the impacts on state and local governments and the coal industry resulting from revisions to the federal coal program. First, as part of its collaboration with interested government stakeholders (see Executive Order No. 12866, Section 1(b)(9) (1993), BLM must perform a federalism assessment. A federalism assessment is required for all regulations and policy statements or actions containing federalism implications. Such implications arise when the actions contemplated by the agency have a substantial direct effect on the states, the relationship between the federal government and the states, or on the distribution of power and responsibilities among various levels of government. Exec. Order No. 12612, Sec. 1(a) (1987). BLM's proposed changes to the federal coal program raise sufficient federalism implications to warrant the preparation of a federalism assessment because any regulatory changes would "have substantial direct effects on the States." *Id.*; see also *id.* Sec. 6(b) (when federalism implications exist, "a Federalism Assessment . . . shall be prepared.").

In preparing a federalism assessment, BLM should identify the extent to which the federal government's proposed changes would impose additional costs and burdens on state governments, infringe on the states' ability to discharge traditional state governmental functions, or infringe on other aspects of state sovereignty. BLM must carefully consider and disclose those impacts on state and local governments, communities, and businesses that rely on federal coal leasing and development.

BLM's proposed changes to the federal coal program threaten to discourage the development of federal coal resources. BLM's consideration of increased costs on federal coal leasing and production will make the business of coal mining uneconomic and will deter future coal development on public lands. BLM's discouragement of federal coal production will harm state and local economies, which rely heavily on the royalties and taxes generated from coal mining operations. State and local governments have a direct and substantial economic interest in the continued production of federal coal. For instance, in Wyoming coal mining provides the second largest source of tax revenue for state and local governments, generating more than \$1 billion in annual revenue from royalties and taxes. See Attachment 6, Wyoming Mining Association, "Coal's Economic Impact."

Pursuant to the MLA, state governments are entitled to approximately 50% of the revenue generated from federal coal lease bonus and royalty payments. 30 U.S.C. § 191(b). The amount of bonus payments and royalties generated from federal coal mining is significant for coal producing states like Montana and Wyoming. For instance, in 2013 alone, the State of Wyoming collected approximately \$259.3 million in federal royalties and approximately \$237.5 million in federal bonus payments. See Attachment 6, Wyoming Mining Association, "Coal's Economic Impact." These revenue sources fund critical state services, such as construction and maintenance on county roads impacted by mineral development, public school systems and community colleges, facilities construction and maintenance for the University of Wyoming, and the construction and maintenance of other important public infrastructure. Wyo. Stat. Ann. § 9-4-601.

Severance and ad valorem taxes on federal coal provide another large source of revenue for state and local governments. For example, the State of Wyoming collects a seven percent severance tax based upon the value of the gross product of coal extracted within state boundaries. *Id.* § 39-14-104 (severance tax imposed by the Wyoming Constitution and Wyoming statute). The severance taxes generated from coal production are deposited into the Permanent Wyoming Mineral Trust Fund and the Severance Tax Distribution Account. *Id.* § 39-14-111. These accounts also provide funding for important public services. The Permanent Wyoming Mineral Trust Fund plays an important role in ensuring and protecting

Wyoming's future financial security. The Severance Tax Distribution Account funds several other accounts which serve other public purposes, such as state and county roads, public facilities and services, water services, and townships. In 2013, it was estimated that the State of Wyoming collected approximately \$288.5 million in severance taxes. See Attachment 6, Wyoming Mining Association, "Coal's Economic Impact." Ad valorem taxes provide another significant source of revenue from coal mining. In 2013, local governments within the State of Wyoming collected approximately \$281.9 million in ad valorem taxes. *Id.* Accordingly, state and local governments have a significant and direct financial interest in ensuring that BLM allows federal coal production to continue, while ensuring the "maximum economic recovery" of federal coal.

Second, BLM must also engage in honest and meaningful discussions with coal producers to better understand the adverse economic impacts associated with federal coal program reform. As discussed throughout this comment letter, America's coal producers are heavily burdened by both current economic conditions and the existing governmental payments required under the current regulatory scheme. To the extent BLM intends to revise the federal regulatory scheme, BLM must prepare a regulatory impact analysis to "assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating." Exec. Order No. 12866, Sec. 1(a)(1993). In doing so, BLM:

[S]hall tailor its regulations to impose the least burden on society, including individuals, businesses of differing sizes, and other entities (including small communities and governmental entities), consistent with obtaining the regulatory objectives, taking into account, among other things, and to the extent practicable, the costs of cumulative regulations.

Id. Through substantive collaboration with the coal industry, BLM will be better positioned to weigh the significant costs on federal coal producers associated with regulatory changes to the federal coal program.

F. BLM Should Reconvene the Royalty Policy Committee

In reviewing the federal coal regulatory scheme, BLM should reconvene the Royalty Policy Committee ("RPC") in accordance with Section 14(a)(2) of the Federal Advisory Committee Act. Cloud Peak Energy welcomes the opportunity for BLM to receive scoping comments from a wide array of viewpoints on the federal coal program. However, the current review is not a substitute for input from the RPC, an entity with specialized knowledge and expertise related to royalty and revenue management from federal mineral leases.

The RPC was established by the Department of the Interior in 1995 to provide advice to the Secretary of the Interior on the management of federal and Indian mineral leases and revenues. The role of the RPC is "to review and comment on revenue management and other mineral and energy-related policies, and to provide a forum to convey views representative of mineral lessees, operators, revenue payors, revenue recipients, governmental agencies, and public interest groups." RPC Charter, Sec. 3 (1995). The Department's August 1, 1995 press release announcing the establishment of the RPC emphasized its importance: "[A]s representatives of groups most affected by mineral revenue practices, this special caucus of experts will serve an important role in advising on issues related to management of the nation's multi-billion dollar, federal and Indian minerals revenue program. Its creation occurs at a critical time when there is an increased emphasis by all stakeholders to make the Royalty Management Program work better and cost less." Attachment 7, Michael Baugher, "Interior Establishes Royalty Policy Committee, Names Members and Sets First Meeting For Denver" (Aug. 1, 1995) (quoting the Assistant Secretary for Land and Minerals Management, Bob Armstrong).

The experts appointed to the RPC would represent a variety of stakeholders, which would ensure that the Department of the Interior appropriately balanced differing viewpoints. According to the Charter, the reconvened RPC would be comprised of state members receiving significant royalty revenues from federal leases, members representing Native Americans (special focus should be given to Indian Tribes that produce coal from their tribal lands), members representing various mineral interests, and members representing public interest groups. RPC Charter, Sec. 12 (1995). The open dialogue created by the RPC would result in a better understanding and appreciation of the concerns raised by each constituency of the RPC and would provide the Department of the Interior with valuable insights that have been applied in proposing and implementing new regulations and policies, as the RPC has done in the past.

Despite the RPC's critical role in advising the Secretary on the management of federal and Indian mineral leases, the RPC Charter was allowed to expire in 2014 shortly before the recently announced reevaluation of the federal coal program; a time when the RPC is most needed. The policy, economic considerations, financial implications, and timing of any lease or royalty change is a highly complex matter. Due to the extensive background, knowledge base, expertise, and motivation of all participants, there is the potential for discussion and resolution of highly technical and complex issues that are paramount to the Department of the Interior's review of the federal coal program. While individuals representing the various constituencies in the RPC would perhaps disagree on the matters of interest, the level of input and discussion would provide the Secretary and BLM with expert advice regarding the contemplated changes to the federal coal program, particularly as it relates to royalty and revenue-related issues. As a U.S. coal producer with nearly 100% of its current operations on federal lands, Cloud Peak Energy would welcome the opportunity to work with governmental and private experts to assess the needs and impacts of potential changes in the U.S. energy and mineral policies.

IV. Comments on the Specific Issues Identified in BLM's Notice to Prepare a PEIS

A. How, When, and Where to Lease Federal Coal

1. BLM Should Retain the Existing Lease-by-Application Framework.

BLM should continue with an applicant-driven application process for federal coal leasing. First, mine operators are in the best position to determine when the next tract of federal coal is needed to ensure its future mining operations. For example, Cloud Peak Energy has a unique understanding regarding its own business operations and is best positioned to determine the timeframe for acquiring additional coal leases. As it currently stands, Cloud Peak Energy determines the timing for obtaining additional coal leases based upon careful consideration of existing coal reserves, the nature and length of the comprehensive permitting process, and market conditions. Any other framework for issuing federal coal leases would fail to address the individual needs of each lessee and the optimal timeframe for acquiring additional coal leases. BLM should defer to each mining company's knowledge and expertise concerning its own business operations, including the need for, and timing of, acquiring additional tracts of federal coal.

Second, BLM has demonstrated the ability to modify an applicant's lease nomination to ensure adequate competition for each lease parcel, as needed. Under the existing framework, BLM may reconfigure lease tract nominations to achieve the most competitive tract configuration and ensure maximum economic recovery of federal coal reserves. In its recent review of BLM lease sales, the Government Accountability Office found that BLM had modified 23% of lease tracts in order to enhance competition. GAO Report at 19. But in any event, BLM always receives FMV for federal coal leases with or without such lease tract modifications. In fact, BLM often receives more than the predetermined FMV of the lease tract, given the confidential nature of BLM's bidding process. See below at 25-26. Thus, the LBA process allows applicants to initiate federal coal leasing, while simultaneously providing BLM with the tools necessary to ensure a fair return to the American public on federal coal. Again, as discussed below at 26, BLM also

ensures maximum economic recovery of federal coal by issuing a lease only when the bid meets or exceeds the FMV, as established by BLM.

Third, BLM should retain the existing LBA process because its proposal to hold scheduled coal lease sales will not result in increased competition for federal coal leases. The substantial up-front costs necessary to commence mining operations make the creation of competitive leasing conditions nearly impossible for periodic scheduled lease sales. See above at 7-8. Unless BLM identifies a lease parcel that is directly adjacent to an existing mining operation, it is unlikely that any coal company (let alone more than one company) would bid on the offered tract. See Attachment 5, BLM Petition Denial, at 4 (Jan. 28, 2011) (“Regional leasing is difficult where existing mines are competing in an open coal market, depleting their existing leases at market rates, and needing to replace reserves throughout a continuum of time”). And if BLM fails to offer parcels adjacent to an existing coal mine at a time that meets the economic and operational needs of the mine, that mine could be forced to prematurely close. Due to the substantial economic costs and additional regulatory burdens associated with closing and then restarting a coal mine, any premature mine closure would likely preclude the leasing and development of coal reserves adjacent to that mine in the future, thereby effectively wasting those federal coal reserves and denying the American taxpayers any revenue on the wasted federal coal. Finally, the use of scheduled lease sales would result in increased environmental impacts. BLM recently explained how the use of scheduled lease sales would result in greater environmental disturbance than allowing the expansion of existing mine operations. *Id.* (“leaving tracts un-leased and undeveloped in between the existing Federal coal lease and the proposed production maintenance tract . . . would require **significant additional disturbance** and cost to mine independently” (emphasis added)).

Fourth, BLM’s attempts to implement scheduled lease sales for other minerals have not been successful. For example, the Bureau of Ocean Energy Management (“BOEM”) holds scheduled sales for offshore oil and gas leases. Since 2000, more than 90% of the 153,689 lease tracts offered for sale by BOEM did not receive a single bid. Of the less than 10% of tracts that received any bid, the majority of those tracts received only a single bid. So too, BLM’s proposal to hold scheduled sales for coal leasing would be neither effective nor efficient. BLM should retain the existing LBA process for coal leasing on federal lands.

2. BLM Should Streamline the Coal Leasing and Permitting Process.

BLM should, as part of its general review of the federal coal program, implement specific measures to streamline the federal coal leasing and permitting processes. A number of steps could be taken to adapt BLM’s program to the current economic realities facing the domestic coal industry, address the need for increased domestic energy security, and help level the playing field among domestic energy sources.

First, BLM should reduce the exceedingly long delays associated with coal leasing and permitting. BLM should establish specific timelines and procedures for expeditious completion of the federal leasing and permitting processes. The reduction in the time necessary for processing federal coal leases and permit approvals would allow leasing of smaller lease tracts.

Second, BLM should consider how the efficient leasing of smaller tracts might better ensure the maximum economic recovery of coal and deliver value to the American people. Smaller coal leases reduce the risk of market uncertainties associated with larger lease tracts. In addition, smaller tracts provide incrementally larger bonus payments to the federal government due to the higher FMV valuations associated with the substantially shortened duration of mining operations.

Third, BLM should collaborate with OSMRE to streamline the leasing and permitting process. BLM and OSMRE should jointly clarify that when OSMRE participates as a cooperating agency in a BLM-led environmental analysis, OSMRE may rely on that analysis when making its mining plan approval determination. Further, the agencies should jointly clarify that OSMRE, when considering whether to

approve the mining plan for federal coal reserves, need not consider any environmental impacts (such as coal combustion) that have already been considered by BLM and which are outside the scope of OSMRE's administrative discretion.

3. BLM Should Reduce the Economic Burden on Coal Companies Involved in the Coal Leasing Process.

The existing economic and regulatory conditions have presented substantial challenges for the domestic coal industry. Due to the decreased demand for coal and the increased abundance of low-priced natural gas, numerous coal companies have been forced into bankruptcy. Moreover, the increased regulatory burdens imposed by the current administration continue to make coal mining more challenging. However, as required under the MLA, BLM must still ensure the maximum economic recovery of federal coal. Given the current state of the industry, BLM should consider ways to reduce the burdens on coal companies and encourage continued coal leasing to ensure that it fulfills its obligations under the MLA.

In order to reduce the burdens associated with federal coal leasing, BLM (and the Department of the Interior more broadly) should consider: (1) spreading bonus bid payments over a longer period of time; (2) decreasing rental payments; (3) withdrawing the coal royalty valuation regulations; (4) waiving BLM cost-recovery imposed during the federal coal leasing process; and (5) improving or consolidating the NEPA process associated with federal coal leasing such that applicants are not required to incur the costs associated with hiring a third party contractor in order to complete the leasing process in a timely fashion.

4. BLM Should Revise the Unsuitability Criteria Used to Determine Where to Offer Coal Leasing.

BLM should review its unsuitability screening criteria, which is used to identify geographic areas suitable for federal coal leasing. Under the existing regulatory scheme, many of the criterion are arbitrary, impractical, and prevent BLM from maximizing the full economic recovery of federal coal. The application of the existing unsuitability screening criterion at the land use planning stage often results in a premature determination regarding the appropriateness of leasing coal in a given area. Often, geographic areas are excluded from coal leasing before a determination can be made as to whether there is any concern that legitimately prevents coal mining or whether those concerns could be avoided through stipulations or other measures. Many of the existing criteria cannot be properly evaluated during the land use planning stage, which involves a high-level view of the geographic landscape to determine available uses on public lands.

For example, Criterion Number 3 requires an unsuitability finding for lands located within 100 feet of public roads. Yet, BLM regularly and consistently uses exemptions as a tool to maximize the economic recovery of federal coal. Criteria Numbers 2 and 6 should also be reviewed at the time BLM considers specific leasing actions. Moreover, Criteria Numbers 9 through 15 relate to the exclusion of certain habitats from coal leasing before the potential impacts from a specific coal leasing action can be assessed. The evaluation of potential impacts to threatened or endangered species and critical habitats could be conducted more effectively and more efficiently at the time BLM considers a specific leasing action. For these reasons, the regulations should be modified to allow BLM to make a determination as to whether leasing in the area is appropriate at the time an applicant submits an application for leasing. BLM's standard practice of granting exemptions for the above-listed criteria is evidence that the consideration of geographic areas for leasing and development is best addressed in the context of specific leasing applications, not in the broader context of land use planning.

B. Fair Return on Federal Coal**1. BLM Lacks Any Factual or Economic Basis for Increasing Either the Bonus Payments or Production Royalties.**

Neither BLM nor any other entity has provided any factual support for the contention that the federal coal program fails to provide a fair return to the American people. Instead, BLM's review of the federal coal program is driven by the current administration's energy policies and the clamoring of various environmental activists. To be sure, the depressed market conditions and recent bankruptcies filed by coal producers are due in part to the deliberate efforts of the current administration and environmental organizations to shut down the U.S. coal industry. These anti-fossil fuel agendas provide no basis for arbitrarily increasing costs to coal producers under the MLA or any other federal statute.

BLM's programmatic review of the federal coal program should not be used as another weapon in the ongoing assault on the U.S. coal industry. Such an approach does not provide a legally-supported or rational basis for BLM's contemplated increase of costs associated with coal leasing, including bonus payments or royalties. Cloud Peak Energy urges BLM to review the federal coal program and its fair return to the American public based upon objective, reliable data and factual information, not the current agenda to shut down the domestic coal industry. A fair review of BLM's own FMV analyses for recent lease sales in the Southern Powder River Basin will reveal that bonus and royalty payments provide a fair return to the American people.

2. The Government Receives Fair Market Value for its Coal Leases.

Any objective review of available data would confirm that BLM receives a fair return on federal coal under the current program. The coal industry is among the most heavily regulated industries in the United States and around the world. Coal companies in the United States expend significant financial resources for the right to mine federal coal. These expenditures include large up-front bonus payments and significant additional costs related to development and production, including rental payments, royalty payments, and taxes. From 2013 through 2015, Cloud Peak Energy has paid an annual average of \$411,333,000 to the government for leasing and mining federal coal. This is more than Cloud Peak Energy's fair share. BLM lacks any justification to increase the economic and operational burdens on the coal industry.

A quick breakdown of the royalties and taxes associated with coal mining on federal lands provides a useful demonstration regarding the fair share paid by coal companies to the American public. Coal produced from the Powder River Basin accounts for the vast majority, approximately 88%, of coal mined on federal leases. According to the Platts OTC Broker Index (on 5/27/2016), the spot price for July 2016 8800 Btu Powder River Basin coal was \$8.78 per ton. The selling price for each ton of coal is subject to numerous federal, state, and county royalties and taxes. As demonstrated by Table 2 in Section I.B.I, Cloud Peak Energy contributes \$3.59 per ton towards federal, state, and county royalties and taxes. Without considering the cost of production, this accounts for approximately 41% of the sale price for each ton of federal coal. In other words, the American people receive approximately 41% of the sale price for federal coal, which makes federally-mined coal among the most heavily taxed commodities in the world. In light of these facts, the suggestion that coal companies receive an undue economic benefit for the right to mine coal on public lands doesn't pass the straight face test.

The federal coal leasing program produces a higher rate of return than any other comparable domestic or international coal regime. Indeed, the royalty rates for private domestic coal range anywhere from 5% to 8%, which is substantially less than the minimum 12.5% for federal surface coal mining. And unlike federal coal producers, private coal mining companies are generally not required to make bonus or annual rental payments.

The federal government also receives a much higher percentage return than coal mining countries like Australia, India, China, the Republic of South Africa, and Columbia. For example, Table 3 (at 9) demonstrates that China receives only 4% to 14% in total royalties, taxes, and other governmental fees related to coal production. Similarly, the Republic of South Africa and Columbia receive less than 10% in total governmental payments. *Id.* By contrast, the U.S. government collects a staggering 32% to 42% on federal coal production. *Id.* Accordingly, there is no justification for the claim that America's coal producers pay less than their "fair share."

3. The Current Coal Leasing Process Ensures Adequate Competition by Requiring Bids to Meet or Exceed the Fair Market Value Established by BLM.

The current leasing process is properly designed to ensure that BLM obtains FMV for federal coal leases. See 43 C.F.R. § 3420.0-2 (BLM's regulatory objective is to "ensure that coal deposits are leased at their [FMV]"). In processing coal lease applications, BLM works with Department of the Interior experts, including ONRR's Office of Valuation Services, to establish an estimate of the FMV for the federal coal using a highly confidential methodology. BLM solicits comments from the public on the FMV for the proposed lease tracts and accepts comments on other relevant factors that may impact BLM's determination. *Id.* § 3422.1(a). BLM also conducts a detailed analysis and prepares a written report regarding the mining method evaluation, the estimated coal reserves by coal bed, coal quality assessment, royalty, lease bond recommendations, and public comments. *Id.* at § 3422.1(b). The ultimate estimated FMV of the federal coal, as determined by BLM, remains strictly confidential and is never released to the public. These strict regulatory requirements for establishing the FMV of federal coal reserves ensure accurate valuation and competition for the proposed lease parcel.

Prior to the lease sale, BLM accepts sealed bids for the proposed lease tract and announces the highest bidder at the conclusion of the sale. Under the current regulations, BLM shall not award any lease unless the highest lease bid **meets or exceeds** the FMV designated by BLM. 43 C.F.R. § 3422.3-2(b) ("The Department . . . shall not accept any bid that is less than [FMV]"); *see also id.* § 3422.1(c)(1); 30 U.S.C. § 201(a)(1). This key regulatory provision provides a mathematical certainty that the American people will receive at least FMV for each and every tract of federal coal leased under BLM's coal leasing program, regardless of the number of actual bidders. And given the confidential nature of the bidding process, BLM almost always receives more than the predetermined FMV of the federal coal lease. Cloud Peak Energy is not aware of any instance where a federal coal lessee submitted a bid that precisely matched BLM's FMV determination. As such, the current leasing process adequately ensures that BLM receives at least FMV for federal coal leases. BLM should reject any proposed modifications on the basis of alleged insufficient competition.

Moreover, as discussed above at 23, BLM's contemplated changes to the coal leasing process, such as holding scheduled lease sales, would actually decrease overall competition for federal coal leases. Due to the capital-intensive nature of coal mining, coal companies seek to develop future tracts of federal coal near their existing operations. Scheduled coal lease sales would make coal leasing less competitive by offering tracts for sale in places and at times that do not align with the economic and operational demands of coal companies. Such an artificial leasing regime would run the very real risk of discouraging coal leasing on federal lands entirely.

In considering adequate competition for federal coal leases, BLM should limit its proposed changes to the confines of the existing LBA process. The current regulatory scheme provides sufficient competition for federal coal leases by prohibiting the issuance of any bid that does not meet or exceed FMV. In contrast, artificially scheduled lease sales would serve to decrease competition for federal coal leases and may discourage coal leasing altogether.

4. Increasing the Royalty Rate Will Decrease the Fair Market Value for Lease Bonus Payments.

The federal coal leasing process has two main components for ensuring that it receives FMV for federal coal reserves. First, the MLA provides that the Secretary shall not accept a bonus bid that is less than the FMV. 30 U.S.C. § 201(a)(1) (“No bid shall be accepted which is less than the [FMV], as determined by the Secretary, of the coal subject to the lease”). Second, the MLA grants the Secretary discretion to establish a royalty rate, not less than 12 1/2% of the value of the coal. *Id.* § 207. Although the bonus bid and royalty rate fall within separate mandates of the MLA, the statutory provisions are directly related. An increase in the royalty rate, as contemplated by BLM, would result in a corresponding decrease in the FMV of bonus payments for federal coal leases.

In response to recent audits of BLM’s coal management program (the GAO and IG Reports), BLM revised its Coal Evaluation Handbook. The primary purpose of the Coal Evaluation Handbook is to guide BLM in determining the valuation of federal coal offered during the lease bidding process. See BLM Coal Evaluation Handbook, H-3073-1, at 1-1 (Oct. 2, 2014). In its Coal Evaluation Handbook, BLM defines the FMV of federal coal:

[FMV] means that amount in cash, or on terms reasonably equivalent to cash, for which in all probability the coal deposit would be sold or leased by a knowledgeable owner willing but not obligated to sell or lease to a knowledgeable purchaser who desires but is not obligated to buy or lease.

Id. at 1-4 (citing 43 C.F.R. § 3400.0-5(n)). In addition, BLM defines the regulatory requirement to achieve maximum economic recovery of coal, which is an economic test based upon when the costs of mining for producing the next unit of marketable coal is equal to the value derived from the sale of the same unit of coal. *Id.* As explained above, BLM accounts for the lease royalty rate as a relevant cost in ensuring maximum economic recovery of federal coal resources. See above at 16. BLM’s Coal Evaluation Handbook acknowledges that: (1) the royalty rate of the lease influences the amount of economically recoverable coal within a lease tract; and (2) the amount of economically recoverable coal within a lease tract influences the FMV of the lease. Thus, an increase in the royalty rate will result in a corresponding decrease in the FMV of the lease, which will result in the unintended consequence of decreased bonus bids. In other words, the higher the royalty rate, the lower the maximum economic recovery of the coal, which necessarily results in a lower FMV assessment.

Moreover, attempting to determine the FMV of coal reserves that are not economically recoverable leads to unreliable value estimates. According to BLM’s Coal Evaluation Handbook, “[a]n income approach analysis predicated on the recovery of coal reserves that are not economically recoverable will yield unreliable estimates of value.” *Id.* BLM must understand that the contemplated changes to the federal coal program (i.e., increased royalties or other leasing costs) would perpetuate the very problem identified by BLM; accurately determining the FMV of federal coal leases.

Before considering any changes to the federal royalty rate, BLM should first assess whether the newly revised Coal Evaluation Handbook has increased, or at least, more accurately represented the FMV, for federal coal reserves at the leasing stage. The Coal Evaluation Handbook has already implemented new guidance to ensure BLM’s receipt of FMV for federal coal leases, including the requirement that BLM take into account current market factors such as “Economic and Domestic Coal Market Data” (i.e., supply and demand, coal prices, market expectations) and “Specific Lease Tract Economic Data” (i.e., markets for specific coal, quality of coal – btu content, sulfur, ash). *Id.* at 3-6 – 3-9. These newly informed FMV analyses may fairly resolve any issues BLM or the auditors found with BLM’s FMV determinations and make clear that any increase in the royalty rate or other leasing costs is unwarranted.

5. **BLM Should Not Rely on Misleading Anti-Coal Reports as Justification for Increasing the Royalty Rate or Other Leasing Costs.**

Throughout the public listening sessions on changes to the federal coal program, BLM and Department of the Interior officials were bombarded with claims about “loopholes” in the royalty valuation system and underpayment of royalties by coal producers. These allegations were almost always based on two so-called “Headwaters Studies.”⁷ Headwaters Economics (“Headwaters”) is an environmental advocacy group that falsely claims to be independent and non-partisan. Cloud Peak Energy incorporates by reference its comments on BLM’s coal listening sessions and the attached peer review on the Headwaters Studies that refute its claims to be “an independent, non-partisan organization.” See Attachment 8, Energy Ventures Analysis, “A Peer Review of Previous Studies by Headwaters Economics” (Sept. 16, 2015).

In two advocacy pieces (January 2015 and May 2015), Headwaters claimed to show that a “loophole” existed in current ONRR royalty valuation of non-arms’ length transactions and that coal producers evaded full royalty payment even in arms’ length transactions. Despite the fact that ONRR receives the sale contracts and details for every sale of federal coal and could readily contradict these unfounded allegations by Headwaters, ONRR has chosen not to do so. Cloud Peak Energy therefore contracted Energy Ventures Analysis (“EVA”) to undertake a peer review of the Headwaters Studies to determine if their data and methodologies were sound. The EVA peer review report categorically demonstrates that Headwaters used faulty data to draw unsupported conclusions and that the allegations of “loophole” exploitation to evade full royalty payment, as well as claims of underpayment of royalties on arms’ length transactions, are patently false. The EVA peer review arrived at the following conclusions:

- There is no basis for Headwaters’ conclusion that a calculated netback mine price is higher than the FOB mine price that producers report to ONRR.
- Headwaters made significant errors in its estimation of federal coal production, which distorted its results.
- The “data” relied upon by Headwaters—prepared by a third party service—on coal sales prices FOB mine do not constitute data. The information relied upon by Headwaters was merely an estimate, with large errors that distorted the analysis.
- The proposed changes to the methodology for valuing federal coal for royalty purposes suggested by Headwaters are neither “transparent” nor “efficient.”
- Headwaters has no basis to speculate that there is a large “loophole” exploited by affiliates and unnamed “brokers” to avoid royalty payments.
- The current valuation system is already “transparent” to the only entity that matters – ONRR.

As the peer review conducted by EVA will be filed electronically and made part of the public record, Cloud Peak Energy requests that any responses by BLM to stakeholders based upon mention of the Headwaters Studies be directed to the EVA peer review so that the public can better understand how they were manipulated by this organization. Furthermore, as part of its review of the federal coal program, BLM should reject the Headwaters Studies as unsupported and unreliable.

⁷ The Headwaters Studies are available at <http://headwaterseconomics.org/wphw/wp-content/uploads/Report-Coal-Royalty-Reform-Impacts.pdf>.

In addition, BLM should also reject the unreliable studies commissioned by other anti-coal organizations, including the White House Coal Report recently issued by the White House Council for Economic Advisers. As discussed above (at 3-4), the White House Coal Report is evidence of the administration's improper predetermination on several key questions posed by BLM in its Notice of Intent for the PEIS. For this reason alone, Cloud Peak Energy requests that BLM disavow the White House Coal Report. The White House Coal Report also suffers from numerous substantive flaws in its underlying assumptions, analysis, and recommendations. A recent white paper prepared by Norwest Corporation has thoroughly debunked the White House Coal Report, as well as several other flawed reports commissioned by environmental non-governmental organizations. See *generally* Norwest Corporation, "Federal Coal Leasing Moratorium: An Examination of the Reasons Driving a Disruptive Policy" (July 28, 2016).

6. BLM Must Conduct a Fair and Transparent Evaluation of the Fair Return on Federal Coal.

Before making any changes to the FMV process, BLM should first consider whether changes to the coal program are even necessary to ensure that the government receives a fair return on federal coal. As discussed above at 25-26, the federal government receives FMV for federal coal under the existing coal program. BLM cannot justify an increase in bonus payments or royalties based solely on speculative and unsupported claims such as those contained in the Headwaters Studies and the White House Coal Report. But to the extent BLM determines that the current FMV methodology requires revision, BLM should undertake a fair consideration of the heavy burdens of existing bonus payments and royalties on coal companies—both in timing and amount—as part of its overall evaluation of the federal coal program. BLM should also consider how the establishment of FMV for coal leases issued under the federal coal program can be made more transparent to the American people.

And at the very least, BLM must ensure that it employs a consistent FMV methodology across all of its BLM offices. Over the years, Cloud Peak Energy has noted considerable inconsistencies across offices regarding the information requested as part of its FMV determination. The only logical conclusion is that BLM offices consider different factual information when making their internal FMV assessment. This was a key finding in the comprehensive reviews conducted by both the Department of the Interior Inspector General and the Government Accountability Office on the federal coal leasing program. See, e.g., GAO Report at 30-33. To date, the Secretary has not disclosed to the public what remedial actions have been taken, or will be taken, to remedy these concerns. Nor has the Secretary provided an update regarding its success in addressing those concerns. The Secretary must thoroughly address the disparity between BLM offices in making FMV assessments. BLM must ensure that its current FMV methodology is applied consistently across BLM offices before undertaking any changes in its FMV methodology.

C. Climate Impacts

1. BLM Lacks Sufficient Expertise and Jurisdiction Over Climate Change Impacts Related to Federal Coal Leasing and Production.

BLM intends to conduct a programmatic review of climate change impacts resulting from federal coal production, transportation, and combustion. However, BLM lacks sufficient expertise and jurisdiction to meaningfully assess climate change impacts, particularly at a programmatic level. BLM is responsible for the regulation of mineral development on public lands, not air quality. BLM lacks expertise concerning air quality issues, including greenhouse gas emissions and climate change. Further, BLM has no jurisdiction over the transportation and combustion of federal coal at coal-fired power plants.

But even assuming BLM had the requisite expertise and jurisdiction, BLM lacks sufficient information to meaningfully evaluate climate change at a programmatic level. There are many variables that affect federal coal leasing impacts, including the location, quality, and demand for federal coal. These factors cannot be accurately predicted at any particular point in time given the ever-changing nature of America's

energy needs and the demand for coal in the international market. This uncertainty only compounds when considered on a programmatic, nation-wide scale. BLM's attempts to analyze climate change impacts at such a broad level would be pure speculation.

Moreover, any analysis conducted by BLM would be rendered meaningless given the uncertain state of climate change science, particularly when considered at a programmatic level. As BLM itself has repeatedly acknowledged, the particular impacts associated with climate change are highly complex, uncertain, and difficult to ascertain. For example, in the environmental impact statement ("EIS") for Cloud Peak Energy's West Antelope II tract, BLM openly acknowledged the "uncertainties associated with the science of climate change." West Antelope II EIS, at 4-100 (2009). In the EIS, BLM did not discuss specific coal leasing impacts on global climate change because "[g]iven the state of the science, it is not possible to associate specific actions with the specific global impacts such as potential climate effects." *WEG v. Salazar*, 738 F.3d 298, 309-10 (D.C. Cir. 2013). In another recent example related to coal leasing, BLM stated the following:

Although the effects of [greenhouse gas] emissions and other contributions to climate change in the global aggregate are estimable, given the current state of science it is impossible to determine what effect any given amount of [greenhouse gas] emissions resulting from an activity might have on the phenomena of global warming, climate change, or the environmental effects stemming from it. It is therefore not currently possible to associate any particular action and its specific project-related emissions with the creation or mitigation of any specific climate-related effects at any given time or place.

Wright Area EIS, at 4-143 (2010). In spite of these assertions, BLM has now switched its position. The proposal to address such complicated climate-related issues in BLM's programmatic review of the federal coal program flatly contradicts its consistent (and correct) position that it lacks the ability to do so.

Other agencies and federal courts have recognized the complexity of global climate change and the resulting limitations on analyzing climate change impacts from specific actions. For example, CEQ recently acknowledged in draft NEPA guidance addressing climate change that "[c]limate change is a particularly complex challenge given its global nature and inherent interrelationships among its sources, causation, mechanisms of action, and impacts." 79 Fed. Reg. 77802, 77823 (Dec. 24, 2014).

Courts have also recognized the complexity of global climate change and BLM's inability to meaningfully address the impacts of a particular federal action on climate change. See, e.g., *WEG v. Salazar*, 738 F.3d at 310 (recognizing that current science does not allow for an intelligent discussion of specific global climate change impacts associated with BLM leasing decisions); *Amigos Bravos v. BLM*, 816 F.Supp.2d 1118, 1129 (D. N.M. 2011) ("[W]hile there may be a generally accepted scientific consensus with regard to global climate change . . . there is not the same consensus with regard to what the specific effects of climate change will be on individual geographic areas." (internal citation omitted)); *Sierra Club v. U.S. Def. Energy Support Ctr.*, 2011 WL 3321296, at *4 (E.D. Va. July 29, 2011) ("A reduction of greenhouse gas emissions in one area or from one source has no effect on greenhouse gas levels that are specific to that area, and may even have no effect on global greenhouse gas levels . . ."). In particular, the Ninth Circuit recently held that BLM has no obligation to speculate in its analysis concerning greenhouse gas emissions and global warming. *Prot. Our Cmty's Found. v. Jewell*, 2016 WL 3165630, at *9 (9th Cir. June 7, 2016). In recognition of these inherent factual, scientific, and technical limitations, BLM should decline to engage in a programmatic assessment of global climate change effects related to the federal coal leasing program.

2. BLM's Consideration of Global Climate Change Must Be Commensurate With Its Obligations Under the Mineral Leasing Act.

The federal coal leasing program is governed by the MLA, which embodies fundamental principles of maximum economic recovery and diligent development of federal coal reserves. In evaluating climate change impacts related to the federal coal program, BLM's analysis must be informed by the MLA, which indisputably favors mineral development. BLM's climate change analysis, including the social cost of carbon, cannot be used as a justification to increase costs associated with coal leasing or otherwise attempt to discourage coal leasing and development on public lands. The social cost of carbon is not only an inaccurate and inappropriate tool to measure climate change impacts, but it is also wholly inconsistent with the MLA's mandate to encourage the development of federal coal reserves.

3. If BLM Intends to Consider Climate Change Impacts in Coal Leasing Decisions, that Review Should Take Place at the Individual Leasing Stage; Not Through a National-Level Environmental Review.

To the extent BLM is determined to consider climate change impacts, such an analysis should only be conducted to a limited extent at the site-specific level when considering a proposal to lease a particular federal coal tract. Unless and until a coal producer submits an application for a coal lease, BLM can only speculate as to the particular demand for coal at any given time, the corresponding environmental impacts associated with that demand, and the potential mitigation tools and technologies that may be available when the coal is actually mined, sold, and combusted. Such speculation is inconsistent with BLM's obligation to undertake sound, objective, environmental analysis under NEPA. 40 C.F.R. § 1500.1(b) (requiring information used in NEPA analysis to be of "high quality" and further declaring "[a]ccurate scientific analysis" as "essential to implementing NEPA").

Under the current regulatory scheme, federal coal leasing and development is subject to comprehensive environmental review. Throughout the leasing, permitting, and mining plan approval process, a proposal to lease, permit, and ultimately mine federal coal faces significant environmental review by multiple federal and state agencies. These regulatory processes also provide multiple opportunities for public participation from interested stakeholders, inviting robust scrutiny to ensure that environmental impacts are fully and thoroughly considered before any leasing or mining takes place. Indeed, the recent GAO and IG Reports, which comprehensively reviewed the federal coal program, did not make any findings that the current regulatory process fails to adequately assess the environmental impacts of leasing coal on federal lands.

To the contrary, the current regulatory process provides a thorough review of the environmental impacts—including global climate change impacts—from leasing and developing federal coal. The leasing and mining of federal coal involves a three-stage, coordinated federal and state permitting and environmental evaluation process with numerous opportunities for any member of the public to comment on and challenge agency findings and conclusions. In order to mine federal coal, the coal operator must first obtain a coal lease from BLM. Before the lease can be issued, BLM undertakes an extensive environmental review under NEPA to consider the environmental impacts that would result from developing the proposed coal lease. BLM's NEPA review at the leasing stage involves coordination with other federal and state agencies, including OSMRE, the U.S. Fish and Wildlife Service, EPA, the Army Corps of Engineers, and the state agencies with jurisdiction over mine permitting (often, the state Department of Environmental Quality). Upon completion of the requisite NEPA analysis, BLM determines whether to offer the federal coal lease at public auction. In issuing coal leases, BLM includes best management practices and stipulations with BLM's official lease form in order to minimize potential environmental impacts.

Once BLM has issued the coal lease, the operator must obtain a mining permit from the state regulatory agency in states with approved SMCRA programs, or from OSMRE in non-delegated states or on Indian

lands. The mining permit ensures the protection of natural resources, such as vegetation, wildlife, and cultural resources. The operator must also obtain an air quality permit (usually from the state air quality regulatory agency) to comply with the requirements of the Clean Air Act. Finally, the operator must obtain approval of the proposed mining plan or mining plan modification from OSMRE. In approving the mining plan, OSMRE reviews previous environmental analyses and approvals prepared by BLM and other state and federal agencies, and reviews BLM's analysis of whether the proposed mine configuration will achieve maximum economic recovery. This final step also involves an additional environmental review pursuant to NEPA. Once the operator obtains approval of the mining plan, it may then proceed with development of federal coal underlying the lease. This comprehensive federal-state environmental and regulatory review process can take anywhere from five to ten years to complete, depending on the complexity of the particular issues or any legal challenges encountered during the process.

The existing regulatory regime provides ample opportunity for complete and thorough consideration of the environmental impacts, including global climate change, associated with coal leasing and production. The current project-specific analysis allows for a more complete review of environmental impacts, which accounts for localized impacts that would be difficult to assess at a programmatic level. BLM should not engage in a speculative, nation-wide review of global climate change impacts of coal leasing that is divorced from actual leasing decisions.

Instead, to the extent BLM continues to analyze climate change impacts as part of its leasing decisions, that analysis should take place within the context of the existing regulatory and environmental review process. Such a limited and site-specific analysis would best serve the purpose of NEPA, which seeks to promote informed decision-making by considering reasonably foreseeable impacts within the control of the agency. See *Dep't of Transp. v. Public Citizen*, 541 U.S. 752, 770 (2004).

4. The Imposition of Climate Change or Other Environmental Costs on Federal Coal Leasing is Unlawful.

As discussed in detail above (at 17-20), the imposition of additional costs on the recovery of federal coal reserves would directly violate BLM's obligation to ensure maximum economic recovery under the MLA. BLM asserts that the PEIS will "examine the climate change impacts of the coal program in the context of the Nation's climate objectives . . ." 81 Fed. Reg. at 17725. Nowhere in the MLA does Congress authorize BLM to impose a climate-related fee on the production of federal coal reserves. BLM has expressly rejected any form of "carbon tax" as unlawful. Attachment 5, BLM Petition Denial, at 7 (Jan. 28, 2011).

Further, an increase in royalties or other leasing costs to account for climate impacts would prevent coal from being produced economically. Any climate change fee imposed solely on the coal industry would unfairly disadvantage federal coal as compared to alternative electrical generation fuels, such as natural gas and renewables. These additional costs would prevent BLM from achieving maximum economic recovery of federal coal—a clear statutory mandate under the MLA—while at the same time punishing electricity consumers by artificially suppressing competition between fuel sources.

D. Socio-Economic Considerations

1. Increasing the Royalty Rate or Other Leasing Costs Will Discourage Federal Coal Development, Penalize Electricity Consumers, and Harm Local Communities Who Rely on Coal Revenues to Fund Critical Services.

BLM must engage in meaningful collaboration with state governments to consider how its contemplated changes to the federal coal program would adversely impact states and local communities. See above at 20-21. Indeed, state officials are in the best position to provide BLM with reliable and accurate information regarding the socioeconomic impacts related to federal coal mining. BLM's collaboration with

state officials is critical given that a number of the potential changes to the federal coal program (e.g. imposing increased royalties and other leasing costs, such as climate change fees) will discourage the development of federal coal to the detriment of states and local communities, which depend on the revenue generated from coal production to fund important local services. Before making any changes to the coal program, BLM must engage in meaningful consultation with states and undertake a thorough review of the socio-economic impacts of those proposed changes on states and local communities that rely on revenue from federal coal mining.

Revenue from federal coal leasing and production provides significant benefits to the federal and state governments as well as state and local communities. Within the last decade (2006-2015), federal coal leases managed by BLM have produced 4.3 billion tons of coal and generated \$9.55 billion in revenue for the United States government. 81 Fed. Reg. at 17721. In FY 2014 alone, federal coal mining provided the State of Wyoming with \$556 million in revenue generated from taxes and royalties. *Id.* Also in FY 2014, other states received significant revenue from federal coal leasing: (1) Utah received \$44 million; (2) Montana received \$43 million; (3) Colorado received \$36 million; and (4) New Mexico received \$16 million. *Id.* In total, the nation's five highest federal coal producing states received nearly \$700 million in revenue from federal coal production in a single fiscal year. Continued federal coal production is critically-important to these state and local economies as it provides crucial funding for public services, such as public infrastructure, schools, hospitals, emergency responders, and other important services.

Coal production on federal lands also provides high-paying jobs and related economic benefits to state and local communities. According to the Bureau of Labor Statistics, coal mining employed nearly 90,000 individuals in 2012. *Id.* As of May 2014, it was estimated that coal mining provided 74,000 direct jobs in the United States. *Id.* Of those direct jobs, it was estimated that approximately 6,500 of those jobs were located in the State of Wyoming with an average salary of \$82,000 before benefits. *Id.*; Attachment 6, Wyoming Mining Association, "Coal's Economic Impact." The average salary of an employee in the Wyoming coal industry is nearly twice the statewide salary average. Attachment 6, Wyoming Mining Association, "Coal's Economic Impact."

The changes contemplated in the PEIS, together with other anti-coal initiatives, will discourage the development of federal coal on public lands by making coal mining economically untenable. Any increased economic burden on the federal coal program through higher leasing and production costs will generate less tax revenue for the American people and will harm state and local economies in the process. The changes contemplated in the PEIS will also result in the loss of jobs that support the domestic coal industry, thereby harming employees, their families, and the community. Through sincere and substantive collaboration with state officials, BLM must carefully consider the socioeconomic impacts associated with the proposed changes to the federal coal program.

E. Exports

1. BLM Coal Leasing Decisions Should Not Consider Highly Subjective and Speculative Coal Export Values in Leasing Decisions.

As part of its PEIS review, BLM proposes to evaluate the extent to which actual and projected coal exports should be considered when making coal leasing decisions. Given the unpredictable nature of American coal exports, it is hard to see how BLM could at the leasing stage meaningfully predict the nature and terms of any export arrangement and how that information would be useful in making a decision on whether to lease any particular tract of federal coal. For example, at the leasing stage, BLM lacks the ability to accurately value future coal exports. Even BLM itself has recognized this fundamental limitation: "During the coal leasing EIS process, it is uncertain who might purchase future PRB coal, how it would be used, and where the coal might be transported to." West Antelope II EIS, at 4-105 (2009).

The factors that influence coal export potential are highly complex and dynamic. The GAO Report and IG Report provide a useful example of one such factor: the fluctuating demand for coal exports. Both reports, published in 2013, discuss the need to consider the increase of exports as part of BLM's FMV determination. See IG Report at 7-8; GAO Report at 36-39. The IG Report provided that 125 million tons of coal was exported in 2012, which represented a 100% increase in coal exports since 2007. IG Report at 7-8. Similarly, the GAO Report provides that "coal exports have increased in recent years—particularly exports to Asia and Europe . . ." GAO Report at 2-3. And in 2012, the United States saw an increase in coal exports of 54% over 2010 exports. *Id.* at 3.

And while the IG Report and GAO Report propose to increase the significance on coal exports in BLM's FMV determination, more recent trends demonstrate why such a proposal would be ill-advised. In January of 2016, the U.S. EIA estimated that total coal exports for 2015 dipped down to 77 million tons of coal, which would represent a 21% decline from the previous year. Attachment 9, U.S. EIA, "Coal Production and Prices Decline in 2015," (Jan. 8, 2016). Moreover, since coal exports peaked in the second quarter of 2012, coal exports have steadily declined. Attachment 10, U.S. EIA, "Quarterly Coal Report" (June 15, 2016). In fact, coal exports have declined for twelve quarters in a row. *Id.* The recent downturn in coal exports due to unpredictable international factors is a prime example as to the risk of trying to meaningfully evaluate the coal export potential at the leasing stage—especially when calculating FMV—given that BLM may make a leasing decision 5-10 years before coal is produced and sold from the lease parcel.

In addition to fluctuating market conditions, coal companies often face transportation issues associated with coal exports, which further complicate BLM's valuation of coal export potential at the leasing stage. In 2013, the IG Report stated that "[c]oal companies are reported to be exploring the expansion of ports in the Northwest United States to enable coal to be shipped overseas" as support for a predicted increase in coal exports. IG Report at 7. Yet, it is difficult to predict when these port expansion projects will materialize. Coal exporters have faced significant transportation issues associated with coal exports. To export additional coal to international customers, existing ports must undergo major infrastructure updates. Port expansion is a time consuming and resource intensive process. And in addition, coal exports from terminals in the Northwest United States have faced significant anti-fossil fuel opposition. BLM cannot meaningfully predict the future coal export potential based upon the resolution of such complicated transportation issues.

Given the challenges currently facing coal exports, how can BLM accurately determine the export potential at the leasing stage, given that coal production often does not commence in a given lease tract until approximately 5 to 10 years after lease issuance? Moreover, how can BLM accurately predict and account for other future factors relevant to the export potential for a specific tract of federal coal? BLM should not, and indeed cannot (see above at 18-19), consider the speculative role of future coal exports when calculating bonus payments, royalties, or other costs associated with federal coal leasing.

For the same reasons, BLM should not consider environmental impacts associated with coal exports in its review of the federal coal program. For instance, BLM lacks certainty regarding the international demand for federal coal, the availability of adequate transportation to global markets, and the sophistication of emissions controls. To be sure, there is far less information available concerning the environmental impacts from coal exports than is known about the environmental impacts from domestic coal transportation and combustion. BLM should not account for any potential federal coal exports in its analysis of the environmental impacts associated with the federal coal program.

2. Inaccurate Assessments of Coal Export Potential Could Discourage Federal Coal Leasing.

Given the uncertainty and complexity related to coal export potential, inaccurate assessments could discourage federal coal leasing. In other words, the improper evaluation of coal export potential could

increase leasing costs to Cloud Peak Energy and other federal coal exporters based on highly speculative future export projections. In situations where coal lessees already experience small profit margins, or are incurring losses, an inaccurate valuation of export potential will likely render uneconomic new investments in production and delivery capacity for federal exports. Accordingly, BLM's consideration of export potential would make international customers for federal coal less attractive, creating an incentive to forego federal coal exports or to focus on the production from private or state coal leases.

The discouragement of federal coal leasing is in direct conflict with the MLA's intent to encourage federal coal development. See, e.g., 58 Cong. Rec. 7784 (1919) ("It is very important that the Federal Government should conserve all the rights and resources it now holds in these public lands and at the same time provide for their development with such financial returns as will aid greatly in the improvement of these portions of the country."). As discussed above, Cloud Peak Energy pays millions of dollars in lease and royalty payments to the Federal government every year. Any inaccuracies in BLM's consideration of coal exports could discourage federal coal development. Such a result would deprive the federal government, and coal-producing states, of much needed revenue.

3. BLM's Consideration of Coal Exports in Leasing Decisions Should Be Limited, at Best, and Must be Based on the Value of Coal At the Mine.

Under its current FMV appraisal process, BLM gives limited consideration to the specific coal sales opportunities and prices for the coal being leased, including the potential for export sales. Based on the GAO Report (at 36), BLM currently considers "in general terms the possibility of future growth in coal exports, and . . . limit[s] tracking of exports from specific mines." Given the uncertainty of evaluating future coal export potential, as discussed above, BLM should continue to place very limited weight on the potential for coal export sales when make leasing decisions for particular coal tracts.

Even the Government Accountability Office warned against "weighting [coal export plans] too heavily in estimating [FMV] because major port infrastructure upgrades are needed on the West Coast to handle increased coal exports." GAO Report at 39. Moreover, the recent GAO Report stated that exports account for a very small percentage of coal production in major coal-producing states like Montana and Wyoming. In those states, exports accounted for less than 2% of total U.S. coal production. *Id.* at 37.

Moreover, as discussed above at 18-19, in terms of establishing the appropriate FMV for a particular lease, BLM must focus on the projected price for each ton of coal sold at the mine. BLM lacks the authority under the MLA or any other statute to consider the value of logistic services revenue for coal sold later through a separate entity (such as a separate logistics affiliate of a vertically integrated coal company like Cloud Peak Energy) in either its FMV calculation or royalty determination. In short, BLM's consideration of coal export potential for a particular lease in its FMV determination cannot take into account the downstream revenue that a separate business or business affiliate obtains for its transportation or marketing services.

4. BLM Should Acknowledge that Basing Leasing Costs on the Speculative Value of Coal Exports May Constitute a *De Facto* Illegal Export Tax.

The U.S. Constitution prohibits a tax on exports. The U.S. Constitution specifically prohibits the imposition of duties on goods by reason of exportation to another country. As it relates to the federal coal program, any proposed change that would impose additional costs based solely on export potential may constitute an illegal tax on exports.

In its review of the federal coal program, BLM proposes to consider whether and how leasing decisions should account for actual and projected coal exports. The imposition of additional costs associated with the export of coal could constitute an illegal export tax. The adoption of any mechanism which

overvalues federal coal leases based on coal export potential would result in increased costs to companies such as Cloud Peak Energy based purely on the export of goods. Such changes to the federal coal program could constitute the imposition of an export tax, in contravention of the U.S. Constitution, Article 1, section 9, clause 5 (“No Tax or Duty shall be laid on Articles exported from any State.”).

Courts have recognized that fees or taxes that apply to the sale of coal into export markets violate the Export Clause. See *Consolidation Coal Co. v. United States*, 528 F.3d 1344, 1347 (Fed. Cir. 2008) (finding that if the Surface Mining Control and Reclamation Act reclamation fee was calculated based on the extraction and sale of coal, such that it applied to coal exports, it would be an unconstitutional violation of the Export Clause as a tax on exports); see also *Ranger Fuel Corp. v. United States*, 33 F. Supp. 2d 466, 467, 469 (E.D. Va. 1998) (holding an IRS-imposed coal excise tax unconstitutional and in violation of the Export Clause).

F. Energy Needs

1. Federal Coal Plays a Significant Role in the Current Domestic Energy Portfolio.

The federal coal program plays a critical role in meeting America’s domestic energy needs. According to the U.S. Department of Energy, coal is the largest domestically-produced source of energy in the United States.⁸ Over the last few years, approximately 41% of America’s coal production has occurred on federal lands. 81 Fed. Reg. 17721. In 2015, federal coal generated an estimated 14% of the electricity in the United States. *Id.* And when combined with state and private generation, coal accounted for 33% of the domestic energy portfolio. See Attachment 11, U.S. EIA, “What is U.S. electricity generation by energy source?” (Apr. 1, 2016). The generation of federal coal provides electricity and heat for millions of Americans every year. The significant contribution of federal coal to the energy sector and the American public is made possible through BLM’s administration of 306 federal coal leases, which contain approximately 7.75 billion tons of recoverable coal. 81 Fed. Reg. at 17721.

Federal coal contributes to the domestic energy economy in several significant respects. First, coal provides a reliable, abundant, and cost-effective source of electricity compared to other energy sources. Historically, states that utilize coal-fired electricity have enjoyed lower electricity costs and less price fluctuation than those with little or no coal-fired electricity. Not only has the price of coal generally been more stable than alternative energy sources, but coal has also historically benefitted electricity consumers by creating a competitive market with natural gas, nuclear, and other electricity fuel sources.

Second, coal strengthens the domestic energy market by creating independence from foreign energy sources. Foreign energy independence protects the United States and the American people from disruptions in global energy supply and corresponding price fluctuations. Third, federal coal supports both local and national economies by providing an important source of jobs for coal miners and other professionals in industries related to coal production, transportation, and combustion. (For a general discussion of the economic benefits of federal coal, see Attachment 12, the comprehensive report by University of Wyoming Professor Timothy J. Considine, “Powder River Basin Coal: Powering America” (2013)). In short, the shift away from federal coal in America’s energy portfolio would have deleterious consequences to the American public by substantially and unnecessarily increasing domestic energy costs and increasing price volatility for American electricity consumers.

⁸ The Department of Energy’s discussion on domestic coal is available at <http://energy.gov/coal>.

V. Cloud Peak Energy's Specific Comments and Recommendations to BLM

There is no economic justification for increasing the financial burden on domestic coal producers through increased leasing costs or other burdens. As demonstrated by numerous recent U.S. coal company bankruptcies, America's coal industry faces unprecedented challenges as it strives to continue providing low-cost, reliable, and safe energy that is critical to our nation and to the health and well-being of all Americans. These persistent, depressed industry conditions are due in large part to the impact of adopted and proposed federal administrative and executive branch actions. In addition to the many administrative actions and legal challenges burdening the coal industry, changes to the federal coal program in the form of increased costs will serve only to exacerbate the industry's challenges and jeopardize the government's ability to receive any future value from federally owned coal resources.

BLM should consider the following facts and specific recommendations during its PEIS review:

- The current administration has targeted America's coal industry through a series of unlawful regulatory and administrative actions. Given the administration's unwillingness to conduct a fair and objective review of the federal coal program, BLM should lift the federal coal leasing moratorium pending its completion of the PEIS. Cloud Peak Energy also requests that BLM disavow the biased White House Coal Report.
- Although the Secretary has directed BLM to undertake a review of the federal coal program through the PEIS, BLM and federal courts have recently and consistently rejected the notion that a significant overhaul of the federal coal leasing program is legally warranted.
- In determining the FMV of federal coal, BLM should consider federal coal lessees' significant financial contributions to the American people, which we believe are unparalleled across any industry in the United States and clearly represent more than a "fair share."
- BLM should retain the current royalty rate and other leasing costs in order to ensure the continued leasing and production of federal coal in accordance with the MLA. Any increase in coal leasing costs would discourage federal coal development, while also reducing federal and state revenues from future coal lease payments.
- BLM should carefully and thoroughly evaluate the impacts of federal coal program reform on state and local communities through meaningful collaboration with coal-producing states concerning socioeconomic impacts related to federal coal mining.
- BLM should implement the recommendations in the IG Report and GAO Report and evaluate their effectiveness prior to undertaking an unnecessary overhaul of the entire federal coal program. In addition, BLM should reconvene the Royalty Policy Committee to undertake a detailed review of the complex royalty and revenue changes contemplated by BLM in its review of the federal coal program.
- BLM should retain the existing LBA framework, while considering ways to streamline the permitting process and reduce the economic burdens on federal coal lessees.
- BLM should not raise the royalty rate on federal coal production. Any increase in the royalty rate would result in the decreased FMV for federal coal leases and decreased lease bonus payments to federal and state governments.
- BLM should acknowledge, as it did in 2011, that it may not legally impose climate change fees or other climate-related fees under the MLA or any other federal statute. Any increase in coal

leasing or production costs to advance the administration's political climate objectives would be unlawful.

- BLM should consider the adverse socio-economic impacts that would result from increased costs on federal coal production. Any increase in coal leasing costs would discourage the production of federal coal and thereby diminish the significant benefits to state and local communities dependent on federal coal production.
- BLM should consider the important role of federal coal in meeting America's domestic energy needs, including the benefits of low-cost, reliable electricity, independence from foreign energy sources, and jobs for workers in coal and coal-related industries.

Cloud Peak Energy appreciates the opportunity to provide these comments as part of the scoping process for the PEIS. Please contact Bryan Pechersky, Cloud Peak Energy's General Counsel, at (720) 566-2938, or me at (303) 290-1621 if you have any questions about Cloud Peak Energy's comment letter or would like additional information.

Sincerely,



Andrew Emrich, P.C.
Holland & Hart LLP
Outside Counsel for Cloud Peak Energy Inc.

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ATTACHMENT 1

United States Senate

WASHINGTON, DC 20510

July 14, 2016

The Honorable Sally Jewell
Secretary of the Interior
U.S. Department of the Interior
1849 C Street, NW, Room 5665
Washington, D.C. 20240

Dear Secretary Jewell:

We write to express our serious concerns about the report entitled, “The Economics of Coal Leasing on Federal Lands: Ensuring a Fair Return to Taxpayers,” published by the President’s Council of Economic Advisers on June 22, 2016. This report purports to answer the principal questions that are the subject of the Bureau of Land Management’s (BLM) ongoing review of the federal coal program under the National Environmental Policy Act (NEPA). In doing so, the Executive Office of the President has compromised the integrity and prejudiced the outcome of BLM’s review process in violation of NEPA. We, therefore, ask that you suspend BLM’s review process and associated moratorium on new coal leases for the remainder of the administration.

On January 15, 2016, you signed Secretarial Order 3338, which authorized BLM to conduct a programmatic environmental impact statement (PEIS) on the federal coal program under NEPA. The order states that the PEIS should address a number of questions, including:

“*whether* the bonus bids, rents, and royalties received under the Federal coal program are successfully securing a fair return to the American public for Federal coal, and, if not, *what adjustments* could be made to provide such compensation...

“*whether* the BLM estimates of fair market value for purposes of establishing minimum bids successfully substitute for competition in the bidding process, and if not, how to better estimate fair market value [and]...

“*whether* the current Federal coal leasing program adequately accounts for externalities related to Federal coal production, including environmental and social impacts.”

(emphasis added). To begin answering these and other questions, BLM held six public meetings between May 17th and June 28th and has solicited written comments from the public through July 28th. BLM has estimated that it will take three years to complete the PEIS. In the meantime, Order 3338 prohibits BLM from issuing new federal coal leases for thermal (steam) coal.

On June 22nd, the President’s Council of Economic Advisers, an agency within the Executive Office of the President, issued its report which claims to answer the principal questions that you set forth in Order 3338. For example, the report states that:

“A review of the coal leasing program indicates that the program has been structured in a way that misaligns incentives going back decades, resulting in a distorted coal market with an artificially low price for most Federal coal and unnecessarily low government revenue from the leasing program.”

The report goes on to say that: “A review of [the federal coal program’s] features finds that they have not fostered an efficient, competitive system that provides a fair return to taxpayers.” As to the question of whether raising coal royalty rates would hurt revenue, it says: “the answer to this is unambiguous: increasing coal royalty payments for Federal leases could bring in substantially greater revenue for States and the Federal government.” The report also addresses “externalities related to Federal coal production” and concludes that “[t]he resulting climate and health impacts are either not internalized in the price of coal at all, or are imperfectly internalized.”

Under NEPA, federal agencies must prepare an environmental impact statement (EIS) prior to taking any “major Federal actions significantly affecting the quality of the human environment.”¹ Major federal actions would include any meaningful changes to the federal coal program. The Council on Environmental Quality’s regulations require, among other things, that an EIS “shall serve as the means of assessing the environmental impact of proposed agency actions, *rather than justifying decisions already made.*”² Federal courts have said the same. For example, the Ninth Circuit Court of Appeals has stated that “the comprehensive ‘hard look’ ...required by [NEPA] must be timely, and it must be taken objectively and *in good faith*, not as an exercise in form over substance, and *not as a subterfuge designed to rationalize a decision already made.*”³

The Council of Economic Advisers’ report has effectively turned BLM’s review of the federal coal program into a pre-baked cake. The Council is an arm of the Executive Office of the President. Its Chairman serves as the President’s chief economist, is a Member of the Cabinet, and plays a lead role in setting administration policy. Its report shows that the White House has already decided that the federal coal program does not provide a fair return to the public or adequately account for externalities and to increase coal royalty payments.⁴ To ensure the PEIS does not justify decisions already made, we ask that you immediately suspend development of the PEIS and the leasing moratorium for the remainder of the administration. A failure to do so will only make the PEIS and decisions purportedly based on it vulnerable to legal challenges.

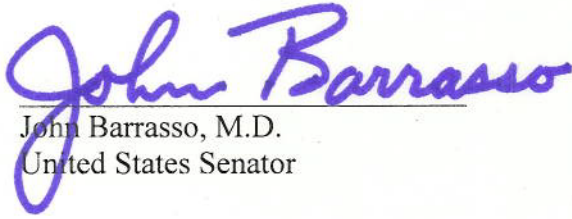
Thank you for your consideration and we look forward to your prompt response.

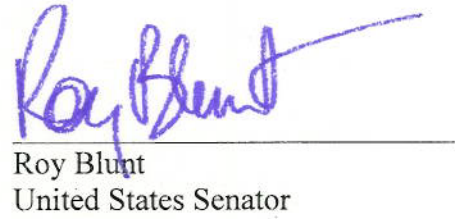
¹ 42 U.S.C. § 4332(c).

² 40 C.F.R. 1502.2(g) (emphasis added).

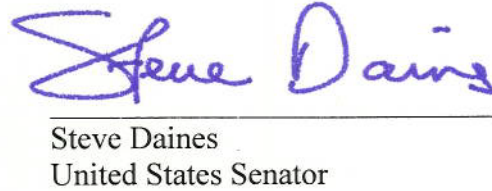
³ *Metcalf v. Daley*, 214 F.3d 1135, 1142 (9th Cir. 2000) (emphasis added).

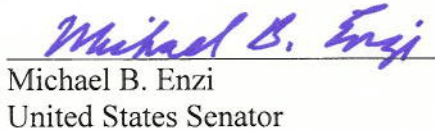
⁴ Others have read the Council of Economic Advisers’ report in a similar manner. On June 22, 2016, Senator Ed Markey (D-MA) issued the following statement: “Today’s White House report shows that taxpayers truly are giving away this public coal at rock bottom prices and are losing out on billions of dollars a year. The Interior Department has the power to increase royalty rates on public coal without Congressional action. It should take immediate action to significantly raise rates on coal mining on public lands before the end of this administration to ensure that taxpayers stop getting shortchanged and that the climate impacts of burning any public coal are taken into account.”

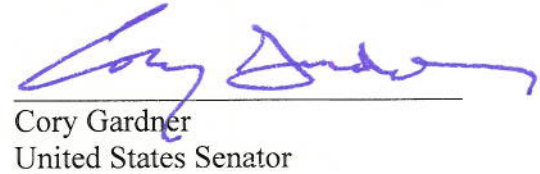

John Barrasso, M.D.
United States Senator


Roy Blunt
United States Senator


Shelley Moore Capito
United States Senator

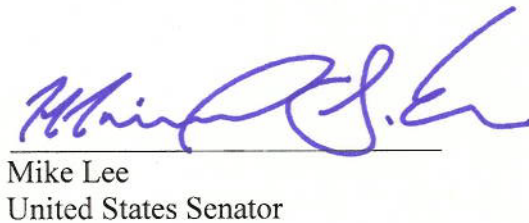

Steve Daines
United States Senator


Michael B. Enzi
United States Senator


Cory Gardner
United States Senator


Orrin G. Hatch
United States Senator


John Hoeven
United States Senator


Mike Lee
United States Senator

Cc: Jason Furman, Chairman, Council of Economic Advisers
Christy Goldfuss, Managing Director, Council on Environmental Quality

ATTACHMENT 2



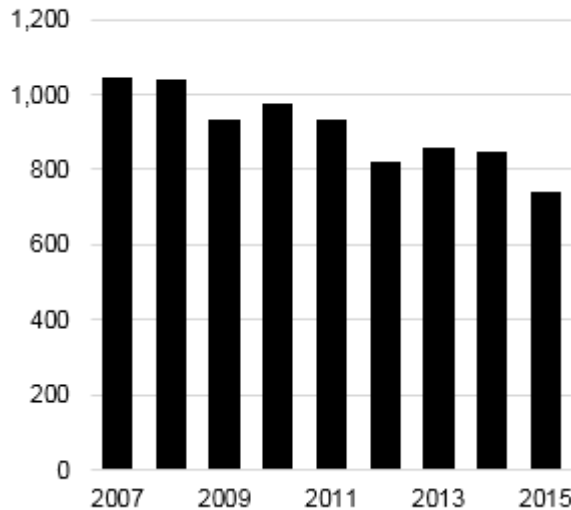
Today in Energy

April 28, 2016

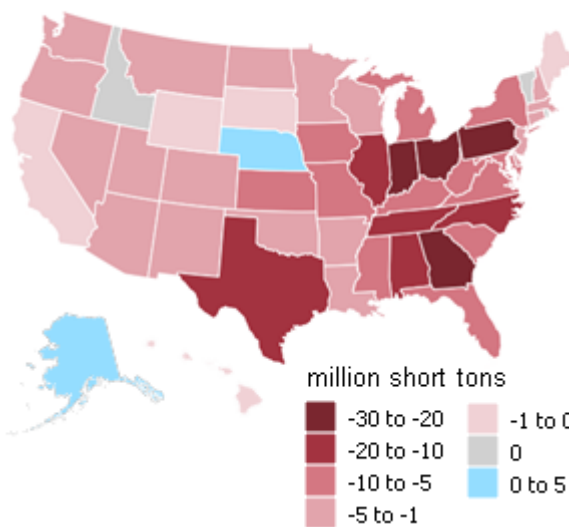
Power sector coal demand has fallen in nearly every state since 2007

U.S. power sector coal demand, 2007-15

million short tons



Change in power sector coal demand 2007-15



Source: U.S. Energy Information Administration, *Power Plant Operations Report Form EIA-923*

Consumption of steam coal used for electricity generation in the U.S. electric power sector fell 29% from its peak of 1,045 million short tons (MMst) in 2007 to an estimated 739 MMst in 2015. Consumption fell in nearly every state, rising only in Nebraska and Alaska over that period. States with the largest declines were concentrated in the Midwest and Southeast, with six states in these regions accounting for nearly half of the national decline. Smaller declines in power sector coal consumption occurred in Wyoming, North Dakota, and Montana, all in the Rocky Mountain region.

In the United States, 97% of all steam coal is used to generate electricity. With little or no growth in electricity sales in most states between 2007 and 2015, coal use for electricity generation is closely related to coal's share of total generation. The price and availability of fuels other than coal have had a major effect on coal consumption since 2007. Increased supply of natural gas and a resulting natural gas price decline spurred increases in natural gas-fired power generation in several states, generally at the expense of coal-fired generation. Electricity generation from wind and solar sources also increased significantly over this period, driven by a combination of federal tax credits, state-level mandates, and technology improvements.

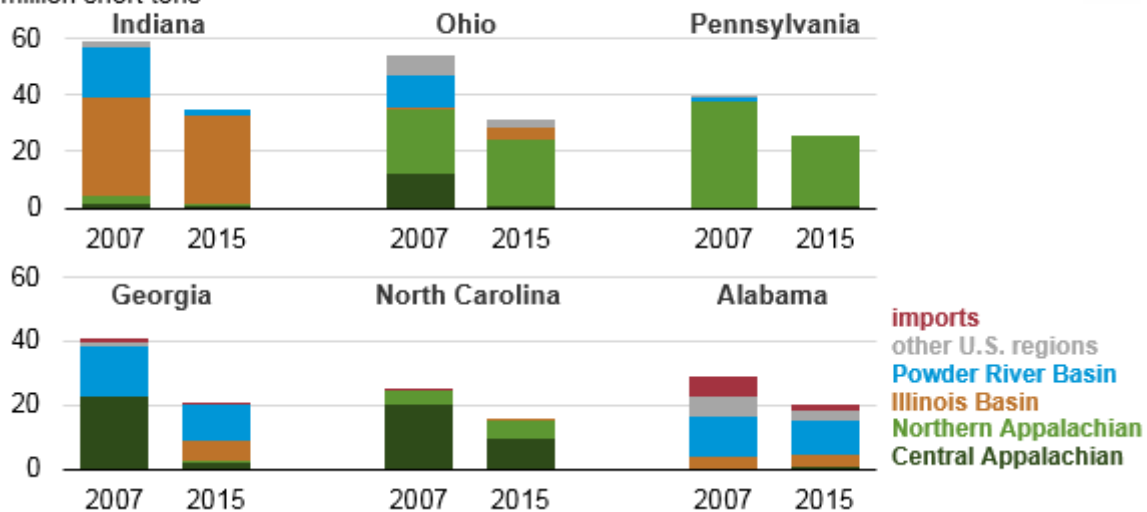
Coal use in the electric power sector decreased in Ohio, Pennsylvania, and Indiana by 49%, 44%, and 37%, respectively, between 2007 and 2015. In Ohio and Pennsylvania, increased production of natural gas from the nearby Utica and Marcellus shale plays resulted in more and relatively less expensive natural gas being available to power plants in these states. Indiana's legislature created a voluntary energy portfolio standard, which took effect in 2012, encouraging electric utilities and retail power generators to generate more electricity from renewable fuels and nuclear, as well as from any [natural gas generators that displace existing coal-fired generation](#). Combined natural gas consumption at electric power plants in Ohio, Pennsylvania, and Indiana increased from 219 billion cubic feet (Bcf) in 2007 to 777 Bcf in 2015. Coal consumption from these three states fell from 176 MMst to 100 MMst over the same period.

In the Southeast, coal consumption in Georgia, North Carolina, and Alabama in 2015 was half the level it was in 2007. Electric power plants in these states increased their natural gas consumption from 338 Bcf to 1,021 Bcf, and they reduced their coal consumption from 110 MMst to 56 MMst.

Power sector coal receipts in selected states, 2007 and 2015



million short tons



Source: U.S. Energy Information Administration, *Power Plant Operations Report* Form EIA-923

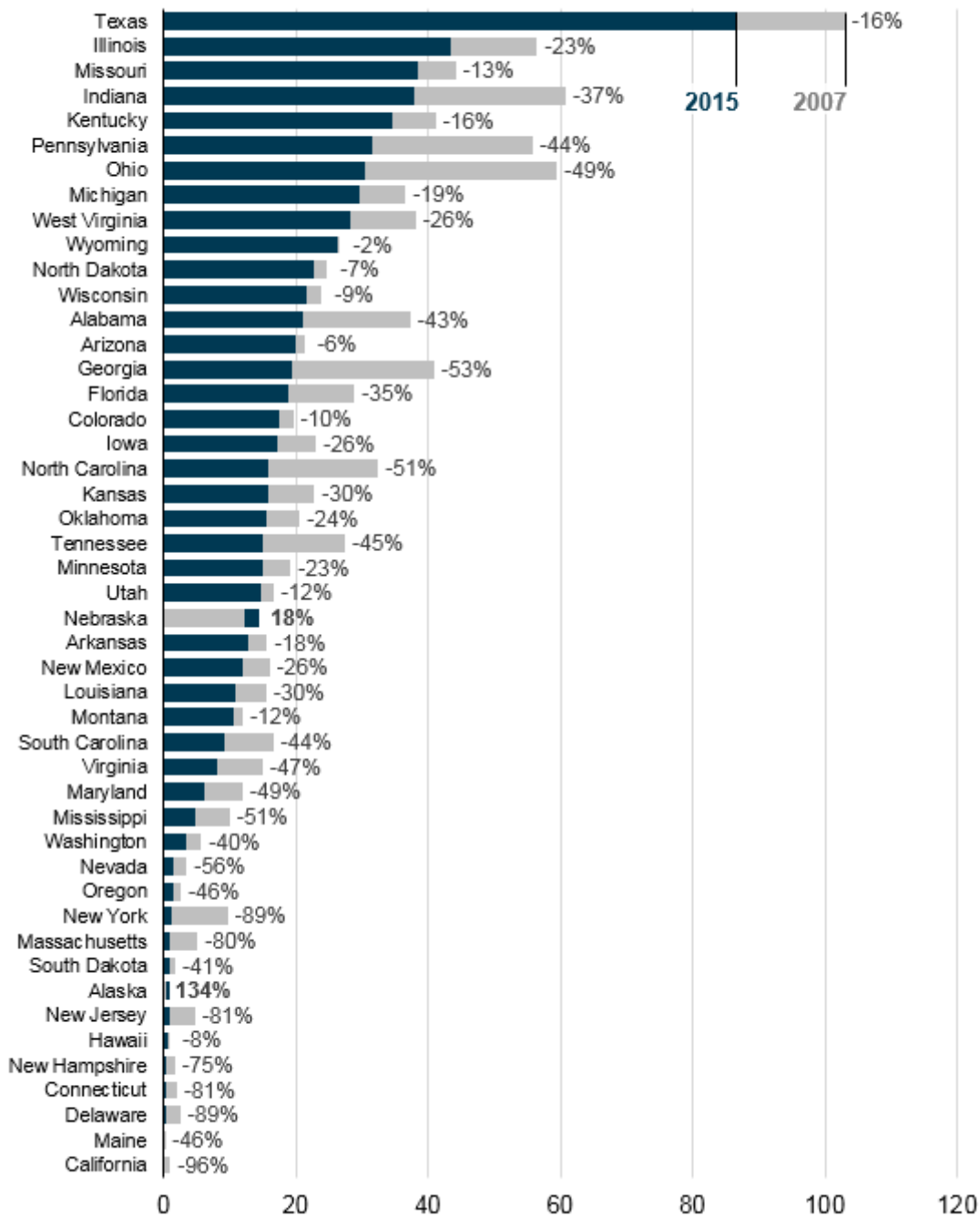
Note: Values reflect coal receipts by electric power plants rather than coal consumption. Differences in receipts and consumption are relatively small and attributable to changes in stockpile levels.

The decline in power sector coal consumption across these six states was often accompanied by shifts in coal supply sources. In general, imports and receipts of coal from distant sources decreased the most. Indiana and Ohio received much less coal from the Powder River Basin in Wyoming and Montana in 2015 than in 2007. In both Georgia and North Carolina, the largest decline in coal receipts came from Central Appalachian coal, which was partially offset by higher receipts of Illinois Basin coal. Alabama's imports of coal (mostly from Colombia) dropped over this period.

Electric power consumption of coal by state, 2007 and 2015



million short tons



Source: U.S. Energy Information Administration, *Electric Power Annual*

Note: Idaho, Vermont, Rhode Island, and District of Columbia have no coal consumption in the power sector.

Principal contributor: Brian Park

ATTACHMENT 3



Today in Energy

June 10, 2016

Quarterly coal production lowest since the early 1980s

U.S. quarterly coal production (Q1 1978 - Q1 2016)
million short tons (MMst)



Source: U.S. Energy Information Administration, [Weekly Coal Report](#), and [U.S. Mine Safety and Health Administration](#)

Coal production in the first three months of 2016 was **173 million short tons (MMst)**, the lowest quarterly level in the United States since a major coal strike in the second quarter of 1981. Among the supply regions, coal production from the Powder River Basin in Montana and Wyoming declined the most in tonnage and percentage since the previous quarter.

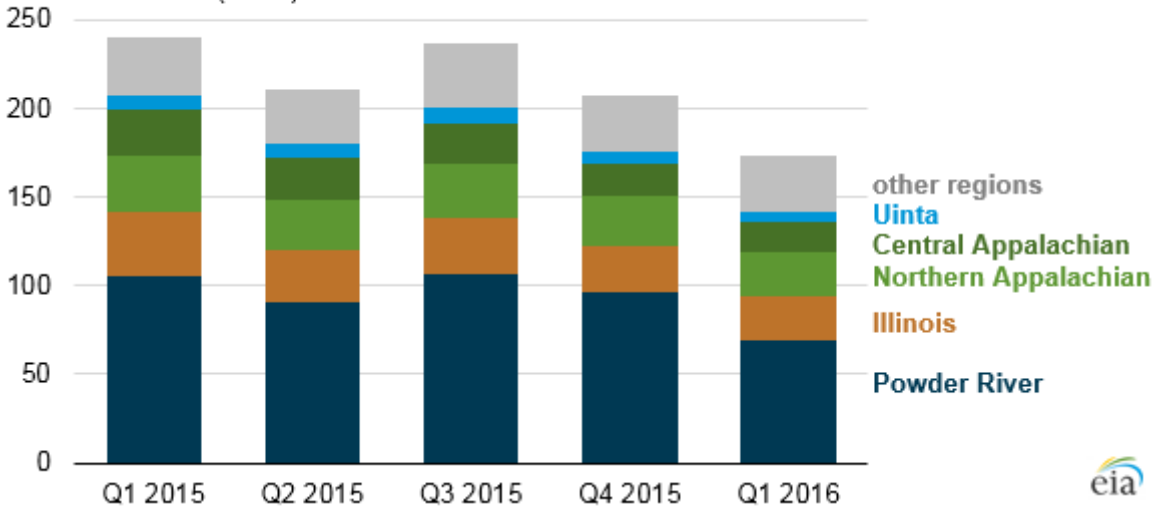
Coal production has declined because of increasingly challenging market conditions for coal producers. Electricity generation accounts for more than 90% of domestic coal use. In addition to complying with environmental regulations and adapting to slower growth in electricity demand, coal-fired generators also are competing with renewables and with natural gas-fired electricity generation during a time of historically low natural gas prices.

A 17% decrease in coal production from the previous quarter marked the largest quarter-over-quarter decline since the fourth quarter of 1984. [Above-normal temperatures during the winter of 2015–16](#) were a key reason for the large decrease in coal production during the first three months of 2016. Throughout the fourth quarter of 2015, electric power plants received more coal than they consumed, leading to a net increase of 34 MMst in coal stockpiles, the highest fourth-quarter net increase on record.

High coal inventories encouraged electric power plants to consume coal from their stockpiles in the beginning of 2016, resulting in lower new coal orders. Decreases in coal purchases have reduced overall coal rail traffic because most producers ship coal by rail. Based on data from the [American Association of Railroads](#), coal carloads in the first three months of 2016 were about 20% lower than in the final three months of 2015.

U.S. quarterly coal production by basin (Q1 2015 - Q1 2016)

million short tons (MMst)



Source: U.S. Energy Information Administration, [Weekly Coal Report](#), and U.S. Mine Safety and Health Administration

Regionally, production from the Powder River Basin (PRB) decreased the most between the fourth quarter of 2015 and the first quarter of 2016. First-quarter coal production of 69 MMst from the PRB was the lowest level since the second quarter of 1995.

The decline in coal demand is not limited to any geographic region. Texas, Michigan, Illinois, and Oklahoma accounted for an average quarterly demand of 37 MMst of PRB coal in 2015, or about 40% of the total PRB coal market. Demand for PRB coal in these four states fell to 19 MMst in the first quarter of 2016.

Principal contributor: Brian Park

ATTACHMENT 4



Short-Term Energy Outlook

Release Date: July 12, 2016 | Next Release Date: August 9, 2016

Coal

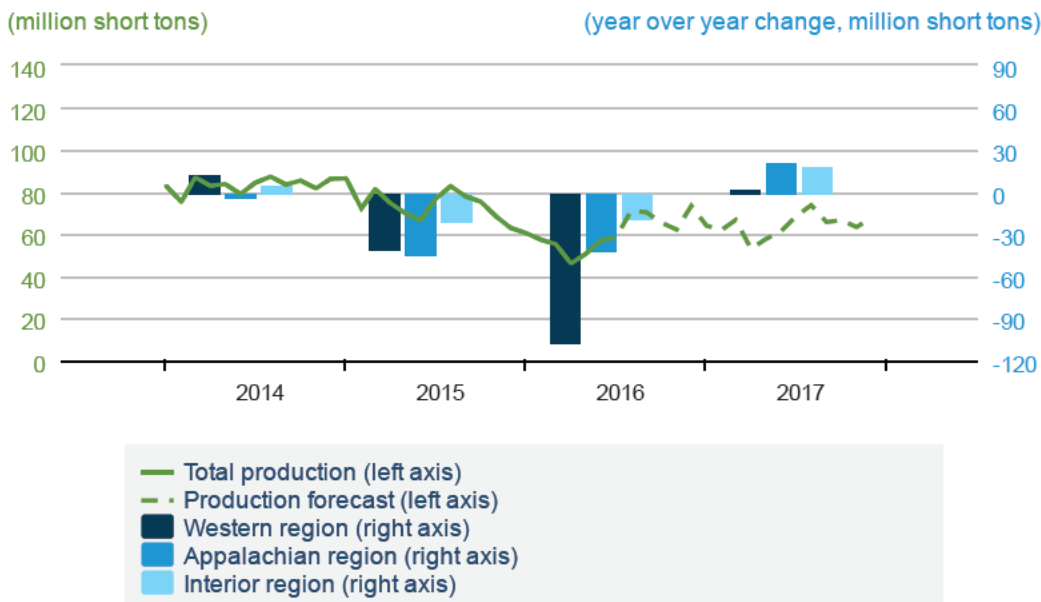
Coal Supply

U.S. coal production in June was 57 million short tons (MMst), a 6 MMst (13%) increase from the previous month and 9 MMst (14%) lower than in June 2015. In 2016, coal production is expected to decrease by more than 100 MMst for the second consecutive year, with a forecast annual decline of 168 MMst (19%), which would be the largest decline in terms of both tons and percentage since data collection began in 1949.

In 2016, forecast coal production in the Appalachian region and in the Western region declines by 18% and by 21%, respectively, while Interior region production declines by 11%. In 2017, total U.S. coal production is expected to increase by 43 MMst (6%), with almost all of the increase coming from the Appalachian region and the Interior region. Coal in these two regions has the advantage of lower transportation costs and a higher heat content per ton compared with Western region coal.

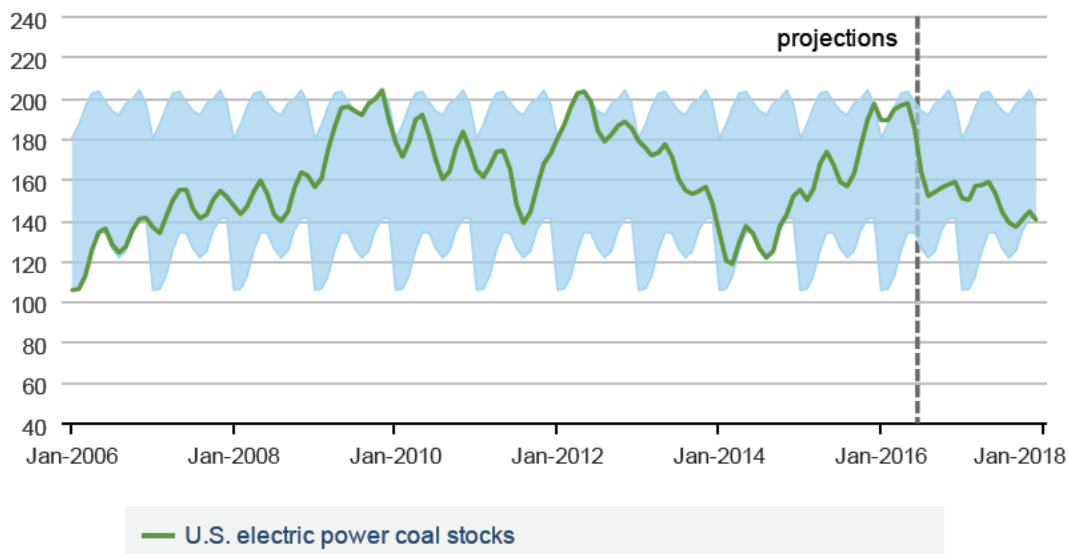
According to the most recent data, [electric power sector coal stockpiles](#) were 196 MMst in April, a 2 MMst (1%) increase from March. The end-of-April coal stocks were 29 MMst (17%) higher than the April 2015 level and 31 MMst (19%) higher than the previous 10-year average for the month. Warmer-than-normal winter temperatures and coal's continuing loss of market share to natural gas for electric power generation contributed to the increase in coal stockpiles. EIA expects that the level of coal stockpiles will decrease over the summer, and power sector inventories will end 2016 at 159 MMst.

U.S. Coal Production



U.S. Electric Power Sector Coal Stocks

(million short tons)



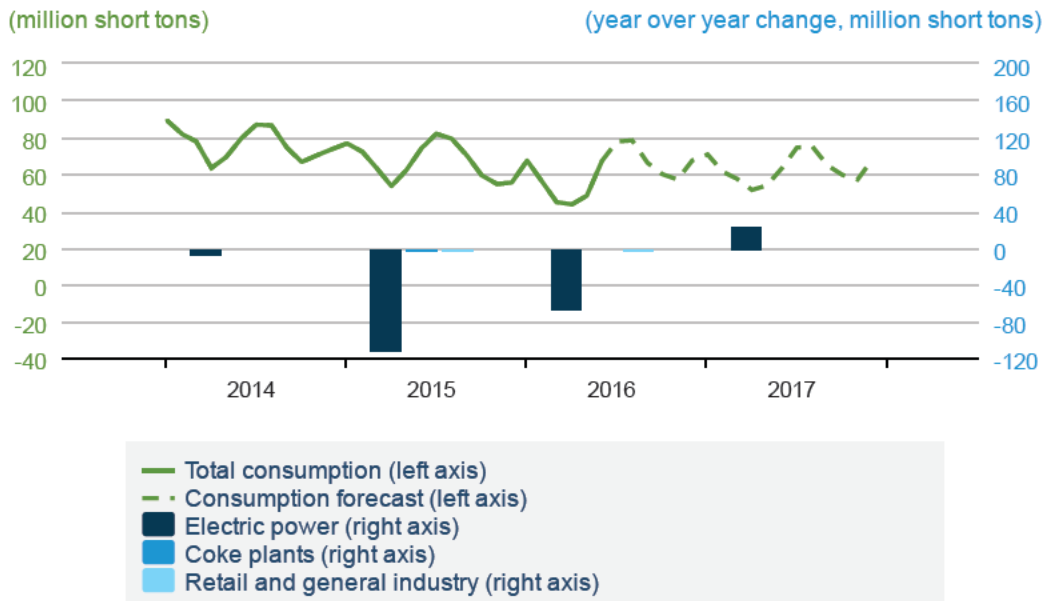
 Source: Short-Term Energy Outlook, July 2016

Note: Colored band around stock levels represents the range between the minimum and maximum from Jan. 2006 - Dec. 2013.

Coal Consumption

Coal consumption in the electric power sector, which accounts for more than 90% of total U.S. coal consumption, is forecast to decline by 66 MMst (9%) in 2016. The decline is a result of competition with low-priced natural gas and of warmer-than-normal winter weather in the first quarter of 2016 that reduced overall electricity generation. Retirements of [coal-fired power plants](#) reduce coal-fired generation capacity in the forecast period, primarily in 2016. The retirements are the result of increased competition with natural gas generation and the industry response to the implementation of the U.S. Environmental Protection Agency's (EPA) [Mercury and Air Toxics Standards \(MATS\)](#). Coal consumption in the electric power sector is forecast to increase by 23 MMst (3%) in 2017, mostly because of rising natural gas prices coupled with increasing electricity generation.

U.S. Coal Consumption



 Source: Short-Term Energy Outlook, July 2016

Coal Trade

Slower growth in global coal demand and lower international coal prices have contributed to the recent decline in U.S. coal exports. April 2016 coal exports were 1 MMst (12%) lower than in March, but they were 36% (3 MMst) lower than the amount exported in April 2015. EIA forecasts U.S. coal exports to decline by 15 MMst (20%) in 2016 and by 4 MMst (7%) in 2017.

Atlantic and Gulf Coast power generators are forecast to maintain their current levels of coal imports, which are primarily from Latin America. Imports are projected to be 11 MMst in both 2016 and 2017.

Coal Prices

EIA estimates the delivered coal price averaged \$2.23/MMBtu in 2015. Forecast prices are \$2.19/MMBtu in 2016 and \$2.24/MMBtu in 2017.

ATTACHMENT 5



United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Washington, D.C. 20240
<http://www.blm.gov>



In Reply Refer To:
3420 (320)

JAN 28 2011

Mr. Jeremy Nichols
Climate and Energy Program Director
WildEarth Guardians
1536 Wynkoop, Suite 301
Denver, Colorado 80202

Dear Mr. Nichols:

This is in response to your petition dated November 23, 2009, in which you requested the Secretary of the Interior to recertify the Powder River Basin (PRB) as a coal production region under 43 CFR 3400.5. Your petition also asks for the establishment of a carbon fee for new coal leases under the Federal Land Policy and Management Act (FLPMA) to create a Global Warming Impact Fund.

The Department of the Interior (the Department) offers Federal coal resources through two types of competitive leasing processes. In a regional coal leasing process, the Bureau of Land Management (BLM) initiates leasing based on its determination of the demand for Federal coal and national energy needs. By contrast, the lease-by-application (LBA) process is initiated by existing coal lessees or individuals (64 FR 52240). Both leasing processes require compliance with the National Environmental Policy Act (NEPA) of 1969 a public process whereby the direct, indirect, and cumulative impacts associated with the leasing action are analyzed.

In order to consider whether it is appropriate to return to Federal coal leasing on a regional basis in the PRB, a review of the Federal coal leasing program is pertinent to the issues raised in your petition. We will address each point in your petition after the background discussion.

Background

The 1976 Federal Coal Leasing Amendment Act (FCLAA) amended the Mineral Leasing Act (MLA) of 1920. The FCLAA requires receipt of fair market value (FMV) for coal leases sold, requires the BLM to ensure the maximum economic recovery of the Federal coal resources, eliminates preference right non-competitive coal leasing, and recognizes prior rights established under the MLA prior to enactment of the FCLAA. The original Federal coal production regions were established, not certified, in 1979 as part of the Federal Coal Management Program (FCMP).

In 1979, the BLM prepared a programmatic Final Environmental Statement implementing the FCMP-identified 12 coal supply regions, including the Powder River Coal Production Region (PRCPR), and further refined these areas by identifying those with significant Federal coal resources. The description of the identified coal production region boundaries were published in the *Federal Register* on November 9, 1979 (44 FR 65196-97). Through the FCMP the Department also promulgated the 43 CFR Subpart 3400 regulations (44 FR 42584-652) guiding the BLM coal program. Two types of advisory boards were established under the FCMP, the Federal-State Coal Advisory Board (FSCAB) and the Regional Coal Teams (RCT). The FSCAB served as the primary advisory for the FCMP body at the national level. The RCTs were originally established under the umbrella of the FSCAB, separately chartered under the Federal Advisory Committee Act (FACA), and serve a primary advisory role for the FCMP at the regional level.

Implementation of the FCMP in the PRCPR began with a regional lease sale held in 1982, and planning for second sale commenced. The second sale was suspended in 1984 due to allegations regarding the 1982 sale. The allegations concerning the 1982 PRCPR sale included criminal disclosure of appraisal information before the sale and failure of appraisal and sale procedures to ensure the public received FMV. There were also challenges to the adequacy of the planning and NEPA work that supported the sale. Two investigations were completed with reports issued in 1984 that evaluated the allegations: Report of the *Commission on Fair Market Value Policy for Federal Coal Leasing* (Linowes Commission, February 1984) and the *Review of Planning Considerations in Federal Coal Leasing* (Office of Technology Assessment, May 1984). On the basis of the findings and recommendations contained in these reports, in the Department made changes to the Federal coal leasing program in 1985. In addition, included in the Linowes Commission's report were several recommendations that the Government should implement leasing policies that distinguish between new production tracts, maintenance, and bypass tracts. As a result, the BLM's consideration of the LBA process in areas of low interest in regional leasing began from recommendations of the Linowes Commission.

As part of the coal program regulations at 43 CFR 3400.4, the Department established the Powder River Basin Regional Coal Team (PRBRCT) to make recommendations on leasing in the PRB. The PRBRCT is composed of the BLM State Directors from Wyoming and Montana, the Governors of Wyoming and Montana; and representatives of the Northern Cheyenne Tribe, the Crow Tribal Council, the U.S. Department of Agriculture-Forest Service, the Office of Surface Mining, the U.S. Fish and Wildlife Service, the National Park Service, and the U.S. Geological Survey. Because the PRBRCT was originally an advisory group as established under regulations at 43 CFR Subpart 1784, the PRBRCT continues to use the public participation procedures from the FACA regulations.

1.0 Decertification

The petition questions whether the 1990 "decertification" of the PRCPR as a "coal production region" was appropriate. BLM policy as stated in the Handbook, H-3420-1, *Competitive Coal Leasing*, allows a lead state director to request the decertification of a designated Federal coal production region if this is the course recommend by the RCT.

When evaluating whether or not to decertify a designated production region, the RCT decision must be based on current and projected market conditions, the potential for emergency leasing, the level of industry interest in Federal coal, public comment, and views expressed by the RCT and the affected state governor. A proposal to decertify a designated coal production region, per policy, must be announced in the *Federal Register* (H-3420-1, Rel.3-235, p. II-4).

During a PRBRCT meeting held on December 15, 1988, a decision was made to gather public comments on a proposal regarding the partial or total decertification of the PRCPR. The discussion was initiated in 1988 because there had been no leasing in the PRCPR since the 1982 sale. By 1989, mine operators in the PRB were running short of reserves to maintain production at existing mines. This resulted in the filing of an emergency LBA during 1989. The PRBRCT recommendation to decertify the region was based in part on the limited expression of leasing interest for new mine development in the region, declining market values for raw coal, and public input. In January 1990, the decision to conditionally “decertify” the PRCPR, consistent with the advice of the PRBRCT and in consideration of public comment, was published in the *Federal Register* (55 FR 784-5). The conditions of this decision included the following: 1) the RCT would continue to be active and guide the subsequent coal LBA process, 2) the LBA was to be restricted to tracts that would continue or extend the life of a mine, 3) applications for new mine starts or to expand existing mine facilities would be considered on a case-by-case basis by the RCT, and 4) operating guidelines for processing coal LBAs being prepared must be acceptable to and approved by the RCT.

This decision to decertify the PRCPR recognized that the PRB was a mature coal production region where a sufficient number of mining operations were in place to meet demand. Leasing demand in the decertified PRCPR was anticipated to be limited to replacement of exhausted reserves, which could be accomplished through maintenance leasing. Under this scenario, leasing by application would match the rate of reserve depletion through production.

2.0 Emergency Leasing

The petition states the belief that the LBA process (per 43 CFR 3425.0-2) can only be used when there is an emergency need for unleased coal or areas outside of coal production regions. As provided in the BLM policy found in H-3420-1, when the RCT makes the recommendation to decertify the designated coal region, it must provide information on the procedures for leasing Federal coal in the area (H-3420-1, p. II-5). Further, this policy states that leasing by application outside designated Federal coal production regions (this includes undesignated regions) is not restricted to emergency situations. While the term “undesignated region” is not specifically defined in this policy, it pertains to those coal regions that have been decertified. The policy supports this conclusion stating, “RCTs also become involved in the lease by application process in those Federal coal production regions that have been decertified and where the RCTs have been retained to oversee the **lease by application** [emphasis added] and related coal leasing activities” (H-3420-1, p. III-9).

3.0 Increased Coal Production

The petition notes that production of PRB coal has increased steadily since decertification. Part of this growth is due to an increase in the demand for electric power and the related increase in demand for steam coal as a fuel for low cost electric generation. There are also cost (mining and reclamation) advantages that have favored PRB coal over other domestic coal regions as well as the coal's low sulfur content which results in cost-effective air pollution control. The production increase has been made with no new mining operations opening since decertification; although, several of the operations have consolidated. The leasing of coal reserves in the PRB under the LBA process has been essentially at the same rate as reserves have been depleted. This level of leasing activity is consistent with the 1990 decertification action.

4.0 Role of Industry in the LBA Process

Under the LBA process, an application for a coal lease is made by the applicant initially identifying those lands that the applicant has determined are necessary to maintain production at an existing mine. The BLM identifies alternatives, which may include more or less lands than are included in the application, or may segregate the lands in the application into more than one potential coal lease. The BLM is able to reconfigure the tract in the public interest, to conserve coal resources, enhance competitive potential, and mitigate impacts. In almost every LBA offered in the PRB, the BLM has delineated a preferred alternative that differs from the application.

It is logical and prudent for the lease tracts to be adjacent to one or more existing mines. These are production maintenance tracts and, as such, are located so that existing operations can pass onto these tracts without leaving tracts un-leased and undeveloped in between the existing Federal coal lease and the proposed production maintenance tract that would require significant additional disturbance and cost to mine independently. Production maintenance leasing can only work in a decertified coal production region.

Regional leasing is a vehicle through which the BLM makes multiple Federal coal tracts available for sale based on the need for leasing as assessed by an analysis of national and regional coal markets. In a regional leasing mode, the BLM considers several criteria to establish the quantity of coal to be offered through regional leasing, including expressions of interest from industry (43 CFR 3420.2(c)(3)). However, the quantity of coal to be offered through regional leasing remains at the discretion of the Secretary on the Interior. Meeting the leasing demand relative to one mine is further complicated in that a regional coal sale will include numerous tracts that are all offered for competitive sale on a single sale date rather than to offering individual coal lease tracts for sale as processing and environment analysis are completed. The regional leasing mechanism is appropriate where new mines are planned, and for competition for new coal mining properties. Regional leasing is difficult where existing mines are competing in an open coal market, depleting their existing leases at market rates, and needing to replace reserves throughout a continuum of time.

In addition, under a regional leasing scenario, the BLM, rather than the applicant, must complete geologic exploration activities and fund regional NEPA analysis. Based on the BLM's current budget forecast and possible lack of personnel needed to complete these evaluations, the results could vary including a reduced return to the public from coal sales (due to sale timing), a higher potential for bypass of leasing Federal coal lands for private lands, and forced emergency leasing. Given these issues, over time BLM decertified all 12 of the FCMP-identified coal supply regions, including the PRCPR.

Under both regional leasing and the LBA process, the sales are always competitive, even if there is only one bidder, because the BLM sets a FMV (using the process explained in the BLM Handbook, H-3070-1, *Economic Evaluation of Coal Properties*) and will not accept any bid that does not meet that value. These values are not disclosed, and bidders recognize that they need to bid a fair value or the bids will be rejected. The BLM has rejected numerous bids that were the apparent high bid.

All of this evidence demonstrates that the BLM practice has ensured fair market values are received for LBA tracts and allows production to be maintained at already operating mines. Meanwhile, the coal resource is managed to avoid bypass and isolation and encourage competition.

5.0 Global Warming

The petition asks for the assurance of the Department that the BLM fully addresses global warming impacts associated with coal leasing in the PRB. It states that decertifying the PRCPR has prevented the BLM from fully analyzing and addressing the environmental impacts of leasing coal, specifically global warming.

The BLM coal LBA NEPA analyses in the PRB recognizes and discusses the issues of greenhouse gases (GHG) and climate change. Foremost, the NEPA analysis clearly states that policies regulating specific levels of significance have not yet been established for GHG emissions. Given the state of the science, it is not possible to associate specific actions with the specific global impacts such as potential climate effects. Therefore, the analysis cannot reach definitive conclusions as to the extent or significance of the emissions on global climate. However, in the interest of full disclosure, the BLM does attempt to quantify the amount of GHG emissions.

The NEPA analysis estimates direct emissions of GHGs as a result of continued mining operations of the applicant mine, the proposed mining operations that may result from the proposed leasing action, and the volume potential GHG emissions resulting from the assumed use of the coal at dispersed electric generation facilities. The site-specific impacts analyzed are based on the assumption that when an LBA tract is offered for competitive lease, the BLM would accept a bid, the lease would be issued, and mining would be authorized under all applicable laws. Further, the applicant for the LBA is assumed to be the lessee, and the proposed lease would be permitted as an extension of the applicant's adjoining mining operations. An analysis of the GHG emissions is completed for each alternative LBA configuration, including the No Action Alternative.

The cumulative impact analysis evaluates the contribution of the site-specific alternatives to cumulative effects on the environment. The cumulative NEPA analysis assumes that existing PRB coal mining will continue at a rate consistent with coal demand forecasts, within the maximum allowable rates under the conditions of the State mining permit, and that all PRB coal will be used for coal-fired electric generation. In total, the NEPA analysis provides an upper limit estimate of the potential GHG emissions resulting from use of the coal that would be produced from the proposed LBA and for the cumulative PRB coal production.

The BLM utilizes publicly available data from the Energy Information Administration (EIA) to model environment impacts of future coal demand. The most recent Annual Energy Outlook 2010 Report (EIA, May 2010) presents an electrical and coal demand forecast to the year 2035. The EIA's forecast (which includes the 2009 downturn in electric demand) indicates that by the year 2035, 44 percent of the domestic electric generation portfolio will continue to be from coal-fired electric generation. So as long as existing coal-fired electric generators can operate in accord with the regulatory and cost factors in effect in the future, they should be able to acquire necessary supplies of coal from national and international coal markets. While EIA projects coal imports to increase from about 2 percent of total supply in 2009 to 4 percent of the total supply in 2035, this is still small in comparison to 90 percent of coal supply in 2035 projected to be consumed for electric generation. Therefore, the demand for domestic coal supplies, and in particular coal from the PRB, is expected to continue.

Further, each NEPA analysis for PRB coal leasing assumes that if the PRB mines are not able to sufficiently produce coal in the future, then more non-PRB coal would be produced to compensate for any market shortfall. Historically, the PRB coal has been favored in many coal markets because of its low cost and it is low sulfur compliant. The potential for regulation of GHG emissions as an air pollutant, and the effect on coal demand is discussed in all BLM coal LBA environmental impact statements (EIS) and decisions (e.g., see Caballo West Record of Decision, page 8). Further, in coal LBA NEPA documents and decisions the BLM acknowledges the movement toward electric generation capacity not reliant on hydrocarbon fuels is positive and that any resultant reduction of GHG emissions would help lessen any effects the GHG emissions may be causing to the global climate system.

Specific regulated levels have not yet been established for GHG emissions. In each NEPA analysis, the BLM discloses that given the state of the science, it is not yet possible to associate specific actions with the specific global impacts such as potential climate effects (see www.whitehouse.gov/sites/default/files/microsites/ceq/20100218-nepa-consideration-effects-ghg-draft-guidance.pdf). Since tools necessary to quantify incremental climate changes associated with specific GHG emissions are presently unavailable, the analysis cannot reach conclusions as to the magnitude or significance of the emissions on climate.

Electric generation activity is directly influenced by consumer demand. In 2005, the PRB provided coal to 35 states (West Antelope II FEIS at 4-104). If electricity cannot be supplied to meet demand and if electric consumer demand remains steady, electric power prices will rise until the electric power markets achieve a new balance of supply and demand. Measures to reduce GHG releases are best applied at the place where the coal is consumed because the coal

consumer must comply with regulatory and price constraints, which in turn affects fuel choices. Attempting to allocate GHG emissions to the many scattered areas where it is consumed as far in the future as 2035 is speculative. Infrastructure, equipment availability, incentives, and cost also determine the potential for switching to non-carbon-based electric generation. Limiting one or even several points of fuel supply will not affect coal use because of the diverse group of national and international suppliers.

6.0 Renewable Energy

The petition suggests that rather than continue Federal coal leasing, the BLM should promote renewable energy development in the PRB. The BLM Wyoming is considering several renewable energy project applications on public lands. However, within the PRB, the BLM manages the Federal coal reserves under predominantly private land surface. For the currently pending LBAs in the PRB, only 3 percent of the land area has Federal ownership of the surface estate. Although there are many wind and solar resources that can be used for energy development, the BLM does not have authority to regulate the use or development of privately held surface estate in appropriate places where BLM manages surface resources, the BLM has prioritized review of Renewable Energy projects.

7.0 Carbon Fees

The petition also requests the Department to consider a new carbon fee that would be applicable to new coal leases. This new carbon fee would be established pursuant to FLPMA as a reasonable charge to reimburse the BLM for the costs of addressing the global warming impacts from coal leasing. Under the BLM's interpretation, the FLPMA establishes that the BLM can charge reasonable filing fees to defer the BLM's administrative costs associated with coal lease processing. The BLM already assesses fees to the applicant for the BLM's administrative costs associated with coal LBA processing. Carbon and any other fees dedicated to raising monies to fund other initiatives would require legislation allowing that authority to the BLM.

The FLPMA cost recovery fee authority is limited to reasonable cost actually incurred by the BLM in processing applications for special use. The BLM has no authority to establish funding sources outside of appropriations from Congress, regardless of the cause. Establishing a Global Warming Impact Fund is outside the scope of FLPMA and the MLA, as amended. Therefore, the BLM cannot consider this suggestion.

Conclusion

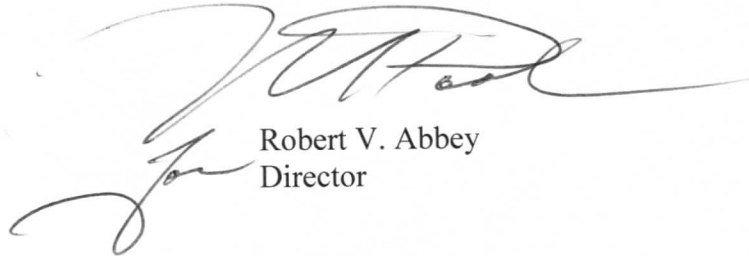
Review of the recent leasing activity in the PRB area of Wyoming and Montana indicates that the BLM continues to effectively manage the PRCPR as a decertified coal region. This is consistent with the following facts:

- All the mines in the PRB have been in place for decades,
- The LBA process provides coal reserves for leasing at a level approximately equal to the depletion by mining thereby assuring an optimum return to the public,
- The LBA process has effectively prevented speculation and bypass of Federal coal resources,

- The LBA process supports competition for Federal coal leases, and
- The BLM has and continues to manage the LBA process consistent with the criteria and conditions that led to decertification of the PRCPR in 1990.

Therefore, and for the reasons outlined in this response, the Department respectfully elects to not “recertify” the PRB as a Coal Production Region, and will not entertain imposing a “carbon fee” to establish a Global Warming Impact Fund.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert V. Abbey", is written over a printed name and title. The signature is fluid and cursive, with a large initial "R" and "A".

Robert V. Abbey
Director

Enclosure

cc: Official; 320 M. Leverette 501LS; 320 B. Martin 501LS; 320RF/hold 501LS
320:BLESAGE:mfw:x912-7116:112210:Locator: 320/Coal/FY2011/Correspondence not IMs-
IBs Filename: WEG Petition Response ver3 (10-12-10)

ATTACHMENT 6



Taxes and payments made by Wyoming's mining industry help build and fund schools all across the state.

Economics

Wyoming's minerals provide the state with severance tax revenue, which is used to help run the government, build schools and highways, maintain the state's water systems, and provide revenue for future generations.

Severance Tax Benefits

In 1969, Wyoming created the first severance tax on minerals under the condition that 2% of all severance taxes be placed in the new Permanent Mineral Trust Fund.

These taxes were proposed for a variety of reasons, particularly to provide for the state when minerals are not profitable to extract, and raise the state's revenues without raising taxes on its citizens.

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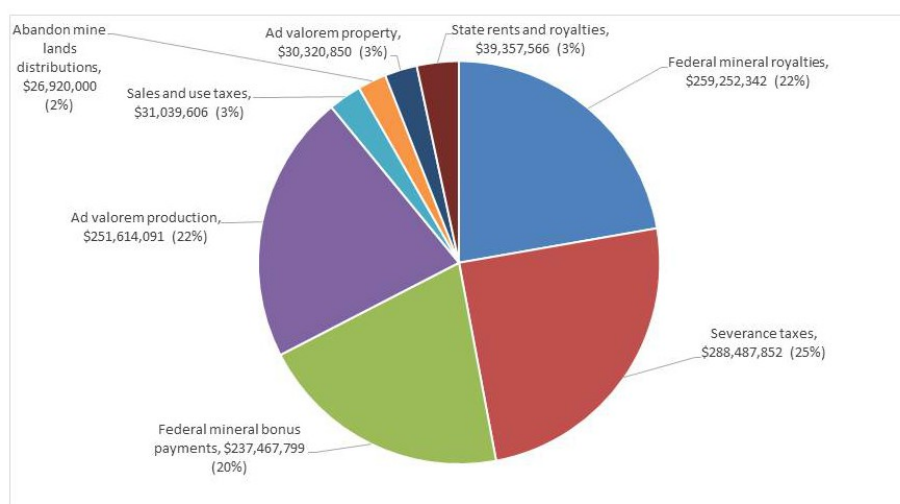
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These taxes insure that costs associated with oil, gas and mineral extraction—road construction, maintenance, and environmental protection—are paid by the producers instead of putting the burden on taxpayers.

Most of the taxes collected go into a general fund that helps fund schools, roads and water systems, and balance the state budget.

Coal's Economic Impact (2013)

Coal is an important source of income for Wyoming, and is the second largest source of tax revenue for state and local government. Coal mining companies pay tax and royalty payments to all branches of government, federal, state, and local. In Wyoming, coal contributes over \$1 billion annually in revenue to state and local governments.



Federal Royalties, \$259.3 million

These royalties help pay for schools and expand the Budget Reserve Account.

Severance Tax, \$288.5 million

Coal contributes to the overall Permanent Wyoming Mineral Trust Fund, which provides for the state when minerals are not profitable to extract, and the taxes became a smaller portion of government revenue.

Abandoned Mine Land (AML) Distributions: \$26.9 million

Password:

SEND

CONTACT US

Wyoming Mining Association

2601 Central Avenue
Cheyenne, WY 82007

Wyoming Mining Association

P.O. Box 866
Cheyenne, WY 82003

(307) 635-0331 Phone

(307) 778-6240 Fax



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These grants are used for mine site reclamation projects on lands and water mined, or affected by, coal mining processes.

Ad Valorem Tax on Production, \$251.6 million

Ad Valorem Tax on Property: \$30.3 million

Ad Valorem taxes are a tax on the property value of the mineral leases.

Federal Mineral Bonus Payments: \$237.5 million

Funds from federal mineral bonus payments build Wyoming schools.

In the past 15 years, money from coal bonus bids has built new schools in every county in Wyoming.

Sales and Use Tax: \$31 million

State Royalties and Rents: \$39.4 million

It's easy to see that Wyoming coal mining is a very big part of the tax money that supports Wyoming and the entire nation.



Without coal mining, Wyoming schools could not offer the superior education that Wyoming children receive today.

Coal Mining Jobs

Wyoming's 19 coal mines employed a total of 6,500 workers in 2014, a 54% increase over the past 10 years.

Coal industry jobs are among the best paying in the state. Wyoming coal miners take home an average of \$82,000 before benefits—almost twice the statewide average. Estimates indicate that each coal

industry position drives the need for three additional jobs in the state.

MISSION

The Wyoming Mining Association serves as a unified voice, providing value at a reasonable cost to its membership, by communicating, influencing, and promoting issues on behalf of the mining industry.

WMA promotes the mining industry by communicating with elected officials, regulators, educators, and the public in a credible way that encourages trust and confidence, and earns respect as a reliable source of information on issues pertinent to the industry.

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(307) 778-6240 **Fax**

TAKE ACTION - BLM Review of the Federal Coal Leasing Program. No New Electricity Tax!

2015-16 Concise Guide to Wyoming Coal.

2016 WMA Annual Convention - Presentations

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ATTACHMENT 7

FOR RELEASE: August 1, 1995

CONTACT: Tom DeRocco
(202)208-3983
Michael L. Baugher
(303) 231-3162

INTERIOR ESTABLISHES ROYALTY POLICY COMMITTEE,
NAMES MEMBERS AND SETS FIRST MEETING FOR DENVER

Secretary of the Interior Bruce Babbitt today announced the appointment of members to, and the establishment of, the Royalty Policy Committee for the Minerals Management Advisory Board.

The committee joins the Outer Continental Shelf Policy Committee, the Gulf of Mexico Offshore Advisory Committee and the Outer Continental Shelf Scientific Committee as members of the Minerals Management Advisory Board.

Established to provide recommendations and guidance to the Secretary of the Interior and the Director of the Minerals Management Service (MMS) on various royalty management policies and procedures, the 28-member committee comprises representatives from federal agencies, involved states, Western Governors Association, Western States Land Commissioners Association, Indian tribes and allottee associations, the minerals industry, and the interested public.

The Royalty Policy Committee is scheduled to have its first meeting in Denver in mid-September to discuss streamlining and simplifying processes associated with collecting and disbursing federal and Indian minerals revenues.

As representatives of groups most affected by mineral revenue practices, this special caucus of experts will serve an important role in advising on issues related to management of the Nation's multi-billion dollar, federal and Indian minerals revenue program. Its creation occurs at a critical time when there is an increased emphasis by all stakeholders to make the Royalty Management Program work better and cost less, said Assistant Secretary for Land and Minerals Management Bob Armstrong.

Through the MMS Royalty Management Program, the Interior Department collects and distributes nearly \$4 billion in revenues each year. Made up of bonuses, rentals and royalties, these revenues are derived from more than 100,000 federal offshore,

onshore and Indian mineral leases.

A portion of the revenues collected from onshore leases is shared with the states in which the leases are located. All revenues collected from Indian leases are turned over to the appropriate Indian organization or individual allottee through the Bureau of Indian Affairs, another Interior agency.

For additional information, contact Clare Onstad, Royalty Management Program, Minerals Management Service, Box 25165, Denver, Colorado 80225, or call (303) 231-3827.

--MMS--

Following is a list of committee members for your convenience:

Members representing states are:

Ernest A. Burguières, III, Louisiana
Johnnie Burton, Wyoming

Members representing Western Governors Association:

Ronald W. Cattany, Colorado
Don Hoffman, Montana

Members representing Western States Land Commissioners Association are:

Gary Carlson, New Mexico
Della Pearson, Texas

Members representing Indian interests are:

Richard L. Ortiz, Shoshone and Arapaho Tribes
Eddie Jacobs, Oklahoma Indian Minerals Owners Association
David Harrison, Council of Energy Resource Tribes
Perry Shirley, Navajo Nation
Thomas Shipps, Southern Ute Indian Tribe
Alan R. Taradash, Jicarilla Apache Tribe and Shii Shi
Keyah Allottee Assn.

Members representing industry interests are:

Wendy F. Daboval, American Petroleum Institute
J. Larry Nichols, Independent Petroleum Association of America
Darrell Gingerich, Council of Petroleum Accountant Societies
David Blackmon, Rocky Mountain Oil and Gas Association

Alex Woodruff, Independent Petroleum Association of
Mountain States
Steven P. Williams, Mid-Continent Oil and Gas Association
Edward L. Sullivan, National Mining Association
Paul E. Smallen, National Mining Association
Joel Rollins, Natural Gas Supply Association

Members representing public interests are:

Sandy Blackstone, a natural resources attorney
Ernest E. Smith, University of Texas at Austin

ExOfficio Members representing federal agencies are:

Kenneth Carfine, Department of the Treasury
Marilyn Rand, Federal Energy Regulatory Commission
Leonard L. Coburn, Department of Energy
W. Hord Tipton, Bureau of Land Management
William L. Collier, Jr., Bureau of Indian Affairs
James W. Shaw, Minerals Management Service, Executive
Secretary

--MMS--

ATTACHMENT 8



Coal Sales Prices used for Valuation and Payment of Federal Royalties

A Peer Review of Previous Studies by Headwaters Economics

September 16, 2015

Prepared for:
Cloud Peak Energy
385 Interlocken Crescent
Suite 400
Broomfield, CO 80021

Prepared by:
Mr. Seth Schwartz
President
Energy Ventures Analysis, Inc.
1901 N. Moore Street, Suite 1200
Arlington, VA 22209-1706
(703) 276-8900



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I. Summary

Headwaters Economics has published two reports alleging that the coal prices reported to ONRR by producers on federal coal leases are substantially less than the actual commodity price for the coal when sold to the end user, leading to a large loss of federal royalty revenue. Headwaters reached this conclusion from its calculation of the average net mine price by coal-producing state from reported delivered coal prices. This study is a review of the data sources, analysis and conclusions reported by Headwaters. The conclusions of our review are:

1. **Headwaters selected results which supported its conclusion while ignoring contrary results.** Headwaters selected only two states (Wyoming and Montana) to support its conclusion, ignoring contrary results from its own analysis for other large federal coal states. While Headwaters claimed that the results for these other states (Colorado, New Mexico and Utah) were not as robust, based upon whether a large majority of coal sales were delivered to the electric power sector, this contention is false. Headwaters inability to replicate the reported mine prices by state from the “net delivered prices” is not evidence of under-payment of royalties on federal coal – it is evidence that Headwaters used poor-quality data and performed inadequate analysis. The fact that Headwaters selected the only two states which seemed to support its conclusion is evidence of Headwaters’ bias, seeking data to support a conclusion which it had already reached.
2. **Headwaters relied upon poor-quality estimated data to perform its analysis.** Headwaters did not have actual data for the mine prices which it estimated from the reported delivered coal prices to electric power companies; it relied upon a private third-party data service (SNL Energy) for these estimates. There are widespread errors in the price estimates from the SNL data service. SNL over-estimated the delivered coal price to the largest customer for Montana coal (which was an unregulated power company so even its delivered coal price was not reported, just estimated), leading to a huge error in its calculation of Montana coal prices. Further, SNL failed to deduct all of the costs included in the reported delivered costs to estimate the net mine prices (it only deducted estimated transportation carrier charges, but failed to deduct destination state sales taxes and rail car costs).

3. **Headwaters did not account for the fact that mines with federal coal leases have non-federal coal leases also.** Headwaters assumed that all coal produced at any mine with a federal coal lease was federal coal. This incorrect assumption resulted in Headwaters over-estimating the average mine price for federal coal in the states of Wyoming and Montana. These states have some large mines which have a “checkerboard” mix of federal and private coal leases. The coal produced from these mines is high-priced coal sold to local (“mine-mouth”) power plants. Headwaters’ assumption that all of this coal was federal coal incorrectly increased its calculated average mine price in these states.
4. **Our detailed analysis of the Montana coal sales data for FY 2014 explained the differences between Headwaters calculated “net delivered” mine prices and the prices reported to ONRR to be due to errors in the data relied upon by Headwaters and Headwaters’ flawed assumptions.** The difference between Headwaters’ calculation of the “net delivered” mine price and the coal prices reported to ONRR was greatest for the state of Montana (Headwaters calculated a mine price 44% higher than the reported price). We analyzed all of the coal sales data for Montana coal from SNL Energy relied upon by Headwaters and found large errors in Headwaters’ calculation due to the following problems:
 - a. SNL had a huge error in over-estimating the delivered coal price to the Colstrip power plant, which is the largest market for Montana coal;
 - b. SNL’s data did not include sales to the second-largest customer for Montana coal (Detroit Edison’s Belle River and St. Clair power plants), which were at lower prices than the average for Montana coal; and,
 - c. Headwaters assumed that all coal production from mines with any federal coal lease were federal coal, but much of the coal produced at the mines with the highest sales prices (Bull Mountains and Rosebud mines) were from private coal leases, so Headwaters over-weighted the higher-priced coal in its average.
5. **Resellers of coal are a very small part of the market and are not a “loophole” avoiding federal royalties.** Headwaters provided no support for its allegation that unnamed “brokers” are reselling coal purchased from producers of federal coal at high profit margins creating an enormous “loophole” to avoid paying federal royalties. Headwaters reached the startling conclusion that the avoided federal royalties are costing the government \$139 million annually, which implies that “brokers” are earning profits exceeding \$1 billion annually (\$139 million divided by the maximum federal royalty rate

of 12.5% equals \$1.11 billion). Actually, the federal data on coal purchases by electric power companies shows coal sales by unaffiliated resellers (Headwaters' unnamed "brokers") were a very small part of the market, only 1.7% of Wyoming coal sales, some of which were power companies reselling excess coal which they had purchased, and just 0.8% of Montana coal sales. The participation of coal trading companies in the market for coal from Wyoming and Montana has dwindled to almost no volume, because they have had difficulty earning any margins at all. Headwaters only evidence that there are large profit margins earned by brokers is its own flawed analysis of "net delivered" mine prices.

6. **The changes to the royalty system proposed by Headwaters are not "transparent".** Headwaters repeatedly asserts that the current system of valuing coal sales for federal royalties is not transparent and its proposed change to using the "net delivered" mine prices would be transparent. In fact, the current system is transparent to ONRR, who has access to every sales contract and transaction by the federal coal lessees and audits these sales. The changes proposed by Headwaters are not transparent; they rely on inaccurate estimates provided by private data companies. Neither the lessees (the coal producers) nor ONRR have access to the data on the delivered coal prices or the "net delivered" mine prices and they cannot check or audit these numbers. Further, the data sources do not include all sales of federal coal, just sales to electric power companies. Headwaters itself was not even "transparent" in its own analysis, as it has not provided its data and calculations for others to review, yet it contends that every coal sales transaction should be available for public scrutiny to check whether ONRR is doing its job auditing coal sales prices.

II. Introduction

Energy Ventures Analysis, Inc. ("EVA") was retained by Cloud Peak Energy ("CPE") to perform a peer review of recent studies regarding the methods used by the Department of Interior ("DOI"), Office of Natural Resources Revenue ("ONRR") to value the sales price used to calculate royalties of federal coal leases. A series of press articles alleging that coal companies were under-paying royalties on federal coal leases¹ as well as a letter to DOI from Senator Ron Wyden requesting

¹ Rucker, Patrick. "Asia coal export boom brings no bonus for U.S. taxpayers." Reuters. December 4, 2012. <http://www.reuters.com/article/2012/12/04/us-usa-coal-royalty-idUSBRE8B30IL20121204>; Davenport, Coral. "U.S. Charging Coal Companies Too Little for Land, Report Says." New York Times. February 7, 2014.

action by DOI² contributed to a proposed rule by ONRR³ to make some changes to the method of valuation of coal sold from federal leases.

Some of this publicity was specifically directed at non arm's-length sales, where coal is sold and valued using market based mechanisms, under formal transactions to affiliated entities. These affiliates were either sales companies owned by the same parent company as the lessees or vertically-integrated power companies which owned the coal supply to their power plants. This type of sale arrangement, which applies to a comparatively small percentage of Federal coal volume and is specifically covered in the existing regulations, is the subject to formal a DOI/ONRR review which was initiated in January 2015.

Subsequent to the announced review of regulations covering non arm's-length sales, there have been further reports claiming that even coal which has been valued using the sales price under arm's-length contracts do not properly reflect the market value of the coal.⁴ These reports allege that there has been massive avoidance of payment of federal coal royalties by failing to report true value of the coal sales to end users and have called for alternatives to change the point of valuation of the coal sales from the mine price (typically known as the FOB, or "free on board", mine price) to the delivered price to the ultimate customer or using the delivered price less transportation costs to determine the FOB mine price (the net mine price), rather than the sales price reported by the lessees (the coal producers).

While theoretically, the "net delivered" mine price should yield the same result as the FOB mine price reported by the lessees, reports by a company called Headwaters Economics ("Headwaters") allege that they have demonstrated that the calculated net mine price (which it calls the "net

http://www.nytimes.com/2014/02/08/us/us-charging-coal-companies-too-little-for-land-report-says.html?_r=0;

² Wyden, Murkowski Seek Answers on Coal Royalty Payments. Press Release, January 4, 2013. Senator Ron Wyden (D, OR). <https://www.wyden.senate.gov/news/press-releases/wyden-murkowski-seek-answers-on-coal-royalty-payments>

³ U.S. Department of the Interior, Office of the Secretary. Interior Department Announces Initial Steps to Strengthen Federal Energy Valuation Rules, Expand Guidance on Federal Coal Program. Bureau of Land Management News Release, December 19, 2014. http://www.blm.gov/wo/st/en/info/newsroom/2014/december/nr_12_19_2014.html.

⁴ Center for American Progress, "Cutting Subsidies and Closing Loopholes in the U.S. Department of the Interior's Coal Program", January 6, 2015. <https://www.americanprogress.org/issues/green/report/2015/01/06/103880/cutting-subsidies-and-closing-loopholes-in-the-u-s-department-of-the-interiors-coal-program/>

delivered price”) is higher than the FOB mine prices reported to ONRR under the first arm’s-length sales price.⁵ Headwaters claims that:

“This method of valuation [i.e., the “net delivered price’] closes the loophole that may allow for companies to structure sales using affiliated brokers to artificially reduce the commodity value of federal coal that is required for royalty valuation. Most importantly, using net delivered costs would close the loophole for all sales, not only for sales where coal is marketed directly by mines and their affiliates.”⁶

Headwaters further states that:

“Using net delivered price has significant transparency advantages, and similar benefits to streamline the assessment process for industry and ONRR compliance audits. Delivered prices are known for sales to regulated utilities (independent of the sale structure). Additional price data is revealed by sales on spot markets, and by market index prices for coal of varying qualities delivered to domestic and export markets. Market analysis firms including Platts and SNL Energy track market prices and transportation costs closely and could be used to reveal prices that would be used by mines for royalty valuation. This transparency would also allow for public review of federal royalty valuation without necessarily revealing contract prices, mining and marketing costs, and other proprietary data.”⁷

Headwaters has prepared two analyses of the “net delivered” mine prices for coal sales from federal leases by state and compared these prices to the average prices reported to ONRR by coal producers on the sales of coal by state from its lessees pursuant to the legal disclosure obligations of the lessees.

In its January Report, Headwaters used data reported by the U.S. Energy Information Administration (“EIA”) on the delivered coal prices reported to electric power companies as well as industrial users and exports. Headwaters used a separate report from EIA on the average transportation cost of coal by state of origin to domestic power companies. Headwaters calculated the average delivered price of all coal sales by state and subtracted the average transportation costs by state of origin to determine the “net delivered” mine price. Headwaters concluded that the average “net delivered” mine price by state was much higher than the FOB mine price reported to ONRR. Headwaters concluded that the avoided federal royalties were huge. In its January Report, Headwaters calculated that using the “net delivered” price would

⁵ Headwaters Economics, “An Assessment of U.S. Federal Coal Royalties”, January 2015. <http://headwaterseconomics.org/energy/coal/coal-royalty-valuation> and Headwaters Economics, “The Impact of Federal Coal Royalty Reform on Prices, Production, and State Revenue”, May 2015. <http://headwaterseconomics.org/energy/coal/coal-royalty-reform-impacts>

⁶ Headwaters May Report at 19.

⁷ Ibid.

have resulted in increased federal royalties of \$173 million annually,⁸ which it reduced to \$139 million annually in its May Report.⁹

There were many limitations regarding the EIA data which Headwaters relied upon in its January Report. EIA withheld the average transportation rates for many states due to confidentiality, so Headwaters had to rely on an incomplete data set to calculate an average. Further, the average transportation rates to the electric power sector could not be applied to the average delivered prices for industrial and export sales. Headwaters also used the average delivered coal price by state of destination for industrial customers, regardless of the origin of the coal, which resulted in an over-estimate of the price for Wyoming and Montana coal, which is much lower-cost per ton.

Headwaters relied upon a different approach to calculate the “net delivered” mine price in its May Report. Headwaters purchased data from SNL Energy, a private market information and analysis firm. SNL relies in part upon prices reported by electric power companies (both regulated and unregulated) to EIA on Form 923. For regulated electric power companies, SNL used the delivered prices reported by EIA and estimated the transportation costs for each transaction to calculate a “net delivered” mine price. For unregulated merchant power companies, EIA does not release the delivered coal price (due to confidentiality). SNL estimates both the mine price and the transportation costs for coal deliveries to these companies. Headwaters used the average mine price estimated by SNL for deliveries to domestic power companies from mines with federal coal leases to calculate the “net delivered” mine price for sales of federal coal by state.

In both the January and May reports, Headwaters concluded that the calculated “net delivered” mine prices were higher than the FOB mine prices reported to ONRR in the states of Wyoming and Montana (the states with the most federal coal production, measured by tons produced). Headwaters takes this result as evidence that there is a “loophole” which results in significant amounts of coal being resold (either by affiliates or independent brokers) at higher prices, thus avoiding paying federal royalties, amounting to a revenue loss of \$139 million annually.

CPE commissioned this report to review Headwaters’ approach and data sources and to analyze whether an accurate and independent analysis of the data used by Headwaters does in fact

⁸ Headwaters January Report at 24 concluded that the increased royalties would have been \$865 million higher over a five-year period.

⁹ Headwaters May Report at 13.

demonstrate that coal is being sold for higher prices than reported to ONRR or whether the current system is working to determine the FOB mine price of coal sold from federal leases.

III. Conclusions

Based upon a review of the data, methodology and calculations used by Headwaters, we have reached the following conclusions:

1. **There is no basis for Headwaters’ conclusion that a calculated “net delivered” mine price is higher than the FOB mine price producers report to ONRR.** In fact, Headwaters’ own results show large inconsistencies, as its calculation of the “net delivered” mine price is *lower* than the price reported to ONRR for more than half of the states, as summarized on Exhibit 1.

Exhibit 1: Comparison of Average Mine Prices Reported to ONRR and Calculated by Headwaters for the Fiscal Years 2008 – 2014¹⁰

State	Reported to ONRR			Headwaters Calculations		Difference	
	Coal Sales (1000 tons)	Sales Value (\$1000)	FOB Mine Price	Coal Receipts (1000 tons)	Netback Mine Price	Sales Volume	Mine Price
Alabama	10,248	\$522,148	\$50.95	1,260	\$65.13	-88%	28%
Colorado	131,470	\$5,520,508	\$41.99	138,570	\$41.73	5%	-1%
Kentucky	1,270	\$99,528	\$78.39	1,483	\$101.75	17%	30%
Montana	163,732	\$2,484,234	\$15.17	137,901	\$21.84	-16%	44%
New Mexico	30,853	\$1,522,424	\$49.34	82,412	\$35.19	167%	-29%
North Dakota	19,747	\$336,469	\$17.04	158,484	\$16.32	703%	-4%
Oklahoma	4,249	\$216,008	\$50.84	2,803	\$28.93	-34%	-43%
Utah	83,542	\$3,030,170	\$36.27	112,036	\$30.89	34%	-15%
Wyoming	2,648,832	\$33,574,705	\$12.68	2,573,019	\$15.50	-3%	22%
Total	3,093,943	\$47,306,193	\$15.29	3,207,965	\$18.05		

Headwaters wishes to focus only on the results for the states of Montana and Wyoming, where its calculations show a “net delivered” mine price higher than the FOB mine price reported to ONRR, explaining that:

“As a result, our results are only robust for states where a large majority of sales from mines with active federal leases are to the domestic power sector. This is true of Montana and Wyoming.”

However, the states of Colorado, New Mexico, North Dakota and Utah all have a majority of sales to the domestic power sector, greater than the state of Montana, yet these are states where Headwaters’ calculated the “net delivered” mine prices to be lower than the prices

¹⁰ Headwaters May Report, Tables 1 and 2.

reported to ONRR. While Wyoming is clearly the largest coal-producing state, the coal sales value reported to ONRR for coal produced in Colorado, New Mexico and Utah are similar in magnitude to Montana¹¹ and the shares of sales to the domestic power sector are equal to or greater than Montana, as shown on Exhibit 2. The fact that Headwaters’ own calculations show that these states have “net delivered” prices **lower** than the prices reported to ONRR is clear evidence that the problem is Headwaters used poor data and performed a flawed analysis, not that the prices reported to ONRR do not reflect the accurate FOB mine price.

Exhibit 2: Share of 2013 Total Coal Production by State delivered to the Domestic Power Sector¹²

State	Total Production	Domestic Power Sales	Power Sector Share
Alabama	18,620	4,137	22.2%
Colorado	24,236	14,413	59.5%
Kentucky	80,380	60,375	75.1%
Montana	42,231	25,000	59.2%
New Mexico	21,969	21,867	99.5%
North Dakota	27,639	21,543	77.9%
Oklahoma	1,136	537	47.3%
Utah	16,977	12,587	74.1%
Wyoming	387,924	373,505	96.3%
Total	621,112	533,964	86.0%

2. **Headwaters made significant errors in its estimation of federal coal production, which distorted its results.** As Exhibit 1 shows, Headwaters analysis did a poor job of matching the total tons sold from federal coal leases by state. Where Headwaters estimated that the sales volumes to domestic power companies were less than the actual coal production reported to ONRR, this could be explained by sales to non-power markets, which Headwaters could not calculate. However, for 5 of the 9 states which it analyzed, Headwaters calculated sales of federal coal to the domestic power sector to be **greater** than the actual total amount of coal produced, which demonstrates that there are problems with the quality of the data and

¹¹ While Headwaters made the statement in its January Report that “Montana coal sales to domestic power plants account for 95.7 percent of sales over the period” 2008 to 2012 (page 19), that is incorrect and refuted by the data in the same report on Tables B1 (207,705,922 tons produced) and B4 (157,090,721 tons sold to electric power sector, or 75.6%). This percentage declined in 2013 and 2014.

¹² EIA, “Annual Coal Report 2013” for coal production data by state and EIA, “Annual Coal Distribution Report 2013” for distribution of U.S. coal to the electric power sector. <http://www.eia.gov/coal/annual/> and <http://www.eia.gov/coal/distribution/annual/>

Headwaters' analysis, rendering any conclusion unreliable. In some cases, the magnitude of the error is huge, 34% for Utah, 167% for New Mexico, and 703% for North Dakota. Even the 5% excess tonnage for Colorado is significant, given the large share of Colorado coal sales to industrial and export markets. This problem demonstrates that Headwaters' analysis is not reliable and its conclusion that federal "royalty revenue could increase by \$139 million annually"¹³ using "net delivered prices" is not supported by the analysis.

The failure to accurately assess the share of coal produced by mine from federal leases created a large error in Headwaters' calculations. In the 2 states where Headwaters calculated higher "net delivered" mine prices than the average price of federal coal reported to ONRR (Montana and Wyoming), there are several large mine-mouth power plants (where the coal supply to the plant is dedicated from mines adjacent to the power plant). For these power plants, the FOB mine price and the delivered price is approximately (assumed to be exactly) the same amount per ton. While these plants have a low delivered price of coal, the FOB mine price is generally higher than the mine price received by mines which sell in the open market. The large mine-mouth plants in these states (Colstrip in Montana and Jim Bridger and Kemmerer in Wyoming) receive coal from mines which have "checkerboard" coal leases, which alternate between federal and private ownership. Thus, the assumption that these mines are 100% federal coal induced a large error in Headwaters' analysis, biasing the average "net delivered" mine price for federal coal well above the average price for coal actually produced from federal leases in these states.

- 3. The SNL "data" on coal sales prices FOB mine are not data, they are estimates, with large errors that distort the analysis.** In its May Report, Headwaters decided only to use data for coal sold to the domestic electric power sector because data for these sales are more readily available. In order to calculate the "net delivered" mine price, Headwaters relied upon a database of coal deliveries to the electric power sector which it purchased from SNL Financial, Inc. ("SNL"), which is a news and information service. The U.S. Energy Information Administration ("EIA") collects data on Form 923 from power generators on their fuel purchases, either monthly (for plants over 200 MW) or annually (for smaller plants). EIA collects data on the coal deliveries, including the tons received, the coal quality, and the commodity price, both delivered and FOB mine. However, due to confidentiality, EIA does

¹³ Id at 13.

not release the FOB mine price and, for unregulated power generators, does not release the delivered coal price either. For regulated utility generators, SNL provides its own estimates of the FOB mine price by relying upon the delivered prices reported by the utilities and released by EIA, less SNL's own estimates of the transportation costs from the mine to the plant.¹⁴ For unregulated plants, SNL does not use the reported delivered price (which is not released by EIA) less estimated transportation costs to estimate the FOB mine price. Instead, SNL uses the delivered price for all coal delivered to each destination state reported by EIA (where it is not withheld to protect confidentiality for unregulated power companies) and deducts the estimated transportation costs to calculate the FOB mine price.¹⁵

The estimated mine prices reported by SNL have large errors and cannot be relied upon for the purpose of determining the "net delivered" mine price as an alternative to the prices reported by the coal lessors to ONRR. For example, the state for which Headwaters found the largest discrepancy between the reported price to ONRR and its "net delivered" mine price calculation was Montana, which was one of only two states where Headwaters found a "problem" where its calculated "net delivered" price was higher than the reported FOB mine price (Headwaters' price calculation was 44% above the average price reported to ONRR as shown on Exhibit 1). The largest consumer of Montana coal is the mine-mouth Colstrip power plant. In calendar year 2014, the mine-mouth Colstrip plant reported receipts of 8,752,704 tons on the EIA Form 923 out of a total of 29,811,530 tons of reported receipts of Montana coal (29.4%).¹⁶ However, EIA does not release the average price of coal delivered to Colstrip because the operator and partial owner of the plant is an unregulated generator (Talen Energy). SNL estimated the delivered price to Colstrip (with the same mine price as

¹⁴ In its May report, Headwaters stated that "Transportation costs are reported for regulated utilities in the U.S. by the Energy Information Administration. Where these costs are not reported, SNL energy estimates transportation costs based on waybill samples from the U.S. Department of Transportation, Surface Transportation Board." (Headwaters May Report at 21). This statement is not correct, or is misleading at best. Because of confidentiality, EIA does not release or report the transportation rates for any coal delivery for any power plant or any mine, whether regulated or unregulated. EIA does publish an annual report providing the total transportation cost for coal by state of origin to state of destination, by subtracting the reported commodity price from the reported delivered price. However, even these data are redacted by EIA for many of the origin-destination state combinations for confidentiality to prevent users from doing the calculations which Headwaters performed. While Headwaters used this annual report in its January report, SNL does not use any EIA data on actual transportation costs in its database. SNL estimates the transportation costs for all coal deliveries, not just those for unregulated companies.

¹⁵ SNL, "Coal Transportation Rate Methodology" at

https://www.snl.com/help/HelpFile/Coal_Transportation.htm

¹⁶ EIA Form 923, "EIA923_Schedules_2_3_4_5_M_12_2014_Data_Early_Release.xls" at <http://www.eia.gov/electricity/data/eia923/>

transportation costs were assumed to be zero) to be \$37.76 per ton in 2014 and \$37.65 per ton in 2013.¹⁷ However, other public sources are available to determine an accurate delivered coal price. One of the plant owners, Puget Sound Energy, is a regulated utility who owns 50% of units 1-2 and 25% of units 3-4. Puget, like other regulated utilities, files an annual report to the Federal Energy Regulatory Commission (the FERC Form 1) which provides the delivered coal price to the Colstrip power plant. Calculating the total delivered price for the Colstrip station from the FERC Form 1 yields delivered prices of \$24.49 per ton and \$25.69 per ton in 2014 and 2013, respectively. Thus, SNL's estimate of the "net delivered" mine price for 29% of all Montana coal was about 50% above the actual reported prices to FERC.

This huge error by SNL, combined with the fact that Headwaters mistakenly assumed that 100% of the production at the Rosebud mine was federal coal, is the primary reason that Headwaters' calculation of the "net delivered" coal price for Montana coal is far above the actual average sales prices reported to ONRR.¹⁸

4. The proposed changes to the methodology for valuing federal coal for royalty purposes suggested by Headwaters are neither "transparent" nor "efficient". Headwaters asserts that: "Changing the price used for valuation to net delivered prices has multiple advantages over using the first arm's-length sale price....Using net delivered price has significant transparency advantages, and similar benefits to streamline the assessment process for industry and ONRR compliance audits."¹⁹ These claims are not supported by Headwaters' own analysis. Headwaters process was anything but transparent:

- Headwaters did not rely upon public data, but rather purchased data from a private service (SNL Financial) not available to the public;

¹⁷ SNL Briefing Book, Colstrip Power Plant at <https://www.snl.com/interactivex/FuelContractDetail.aspx?Period=2014&Q=0&ExpM=0&FCT=-1&FT=-1&MSt=Any&MPR=-1&IsBuyer=1&Region=0&HC=4062485&ID=2449&Type=2&lvl=4&ViewBy=1&PP=2449&updYear=1&updOther=0>

¹⁸ Of course, ONRR has access to the actual coal contracts and sales prices from the Rosebud mine to the Colstrip plant. In fact, the Department of Interior audited the sales price to the Colstrip plant and brought litigation against Western Energy (the Westmoreland Coal subsidiary which owns the Rosebud mine) which it successfully settled to receive royalties on the payment for conveyor transportation costs to Colstrip. See Westmoreland Coal SEC Form 8-K at <http://www.sec.gov/Archives/edgar/data/106455/000095012309022460/0000950123-09-022460-index.htm>.

¹⁹ Headwaters May Report at 19.

- The database used by Headwaters did not cover all coal sales, just sales to electric power companies, which were only about 80% of U.S. coal production in 2013;²⁰
- EIA only reports delivered prices for plants owned by regulated electric utilities, which excluded 27% of all coal purchases by electric power companies reported to EIA in 2014;²¹
- EIA does not disclose the FOB mine price for any sales transaction due to confidentiality, so ***all of the prices relied upon by Headwaters were estimates, not actual sales prices;***
- The EIA data on electric power coal purchases is not released promptly; the 2013 calendar year final data was released on March 10, 2015, hardly an efficient source of information;
- The mine price estimates used by Headwaters were not performed by an official government entity, like ONRR, or a regulated entity with legal reporting obligations, but rather by an unofficial private service with no demonstrated reliability; and,
- Headwaters itself was not transparent in its report; it has not released the data which it used or the calculations which it performed, but rather just a couple of tables summarizing 7 years of data and analysis.

Headwaters states that “Additional price data is revealed by sales on spot markets, and by market index prices for coal of varying qualities delivered to domestic and export markets.”²²

These are exactly the price benchmarks which ONRR has proposed to eliminate for use in valuation of non-arm’s-length transactions, due to claims by Headwaters and others that these prices do not properly value the actual sales price received by lessees. While market index prices for coal sales on the over-the-counter (“OTC”) markets are good indicators of current market prices, they are not as accurate as the actual sales contract prices reported to ONRR, which provide the prices received on the actual coal shipments.

- 5. Headwaters has no basis to speculate that there is a large “loophole” exploited by affiliates and unnamed “brokers” to avoid royalty payments.** Headwaters asserts that “current subsidies in the regulation and marketing loopholes due to royalty valuation policy were worth about \$850 million between 2008 and 2012.”²³ Headwaters describes this “loophole” to be the fact that proceeds for the resale of coal by affiliate marketing companies or

²⁰ EIA, “Annual Coal Report 2013” shows total U.S. coal production in 2013 to be 982,876,000 tons, while EIA “Annual Coal Distribution Report 2013” shows distribution of U.S. coal to the electric power sector to be 785,121,000 tons. <http://www.eia.gov/coal/annual/> and <http://www.eia.gov/coal/distribution/annual/>

²¹ EIA Form 923, “EIA923_Schedules_2_3_4_5_M_12_2014_Data_Early_Release.xls” at <http://www.eia.gov/electricity/data/eia923/>

²² Headwaters May Report at 19.

²³ Headwaters January Report at 25.

independent “brokers” are not subject to royalties on their gains (Headwaters does not mention the possibility of losses on resale). Headwaters accuses the coal companies of deliberately underpaying royalties by using affiliated marketing companies, stating: “For example, companies have arguably exploited a loophole that allows mines to transfer coal for low mine prices to affiliates who then remarket coal to consumers at the higher full commodity value of the coal.”²⁴ Headwaters acknowledges at one point that the proposed changes by ONRR would close the “loophole” for affiliated marketing companies: “The net delivered price and the first arm’s-length sale price are the same price for all sales where mines and their affiliates are marketing coal directly to consumers. In these instances, the contract value reveals the price that would be used for royalty valuation.”²⁵ However, Headwaters contradicts this conclusion when it states that: “ONRR’s assessment that proposed reforms would not generate additional revenue suggests arm’s length price reforms would not effectively close the “affiliate” loophole. This is at least partially due to the fact that the loophole would remain open for independent brokers.”²⁶

Headwaters performed no analysis of the role of independent brokers (more properly called trading companies) which purchase coal FOB mine from producers and resell the coal to ultimate customers, hoping to make a profit. Nevertheless, Headwaters alleges that these transactions are generating huge profits creating a “loophole” to avoid paying royalties. Headwaters’ May report asserts that federal royalties would increase by \$139 million annually by using the “net delivered” mine price²⁷ instead of the reported FOB mine price, which would imply that the profit margins for the coal trading companies must be over \$1.1 billion annually (at a 12.5% royalty rate). Our analysis of the EIA 923 data reported by the electric power companies shows that the claim that brokers play a large role in the ultimate sale of coal to consumers is false.

The power companies report the name of the coal supplier for each monthly purchase as well as the mine which is the source of the coal (EIA provides the reporting companies with a dropdown list of mines to select using the ID number assigned by the Mine Safety and Health Administration, or “MSHA”). The 2014 EIA 923 data reports 29,887,563 tons of coal delivered from the state of Montana and 389,217,875 tons from the state of Wyoming. None of the

²⁴ Headwaters May Report at 2.

²⁵ Headwaters May Report at 19.

²⁶ *Id.* at 2.

²⁷ *Ibid.*

deliveries from the state of Montana had an unknown MSHA ID and only 210,799 tons from Wyoming (0.05%) had an unknown ID (meaning that the customer did not know what mine the coal origin). For the Montana coal deliveries, the supplier name reported by the buyers was the coal producing company for all but 252,982 tons (0.8%) sold by third parties (C. Reiss, Traxenergy and the City of Marquette) and 890,461 tons (3.0%) sold to Consumers Power by Venture Fuels, an affiliate of Cloud Peak Energy which has a separate royalty agreement with ONRR to account for affiliate sales. As the affiliate sales issue is being addressed by the current review underway by ONRR, only the miniscule amount of third-party sales (0.8%) could possibly be sales by “brokers” who are profiting by the resale of coal and not paying federal royalties on the sales margin. For deliveries of Wyoming coal, only 6,611,617 tons (1.7%) were identified as coming from suppliers who were not the companies which owned the mine which was the origin of the coal. One third-party supplier sold most of this coal (Twin Eagle Resource Management²⁸ – 4,687,125 tons) and 4 other sales companies sold between 100,000 and 500,000 tons (Peabody CoalTrade, Cargill, C. Reiss and Robindale/RES Coal). Another 3 power companies (NRG, Alliant and Luminant) resold a total of 422,721 tons, while the remaining 214,795 tons were sold by 6 trading companies.

These very small amounts of coal re-sold by trading companies and power customers can have no meaningful impact on the calculation of the average sales price used to determine federal coal royalties. Coal trading plays a very small role in the markets for Montana and Wyoming coal and has an equal probability of losses as it does of profits. Most coal trades are to balance monthly shipments and production. Most independent coal trading companies have ended participation in the OTC market for Powder River Basin coal, as the markets have little liquidity or volatility which are needed to support a trading business.

- 6. The current valuation system is already “transparent” to the only entity that matters – ONRR.** Headwaters wants “transparency” for “public review of federal royalty valuation”²⁹, for which the only purpose is for the public to check if ONRR is doing its job properly. ONRR currently has complete “transparency” for review of every coal sale made by a lessee, including sales to affiliates and “brokers”, which Headwaters alleges are taking advantage of a “loophole” in the valuation process. ONRR is an agency which is entrusted by Congress to

²⁸ Twin Eagle acquired an energy trading company previously known as Enserco and the total includes sales reported as both Twin Eagle and Enserco.

²⁹ Ibid.

perform this task and it is subject to outside audit by an Inspector General and the General Accounting Office. There is no reason to suppose these agencies are not doing their job and Headwaters' unsupported claims to not make its implications of malfeasance credible. Headwaters acknowledges that "contract prices, mining and marketing costs"³⁰ of the lessees are proprietary data properly kept confidential, yet wants the general public to be able to duplicate all of these proprietary sales transactions to check ONRR's work. This is like asserting that the public should be able to review individual income tax returns to check whether the Internal Revenue Service is doing its job properly.

IV. Analysis of Montana Coal Sales Prices for Mines with Federal Leases

Headwaters alleges that the average coal price reported to ONRR for the states of Montana and Wyoming are below the average mine price for these states calculated from the SNL data for mines with federal coal leases. In particular, Headwaters claimed that the actual FOB mine price for coal sold from federal leases in Montana was 44% higher than the average price reported to ONRR over the 7 year period covering Fiscal Years 2008 – 2014.

In order to test the validity of Headwaters analysis and the data which it used, we have performed a detailed analysis of its calculations of the Montana "net delivered" coal price, where it alleges the largest discrepancy with the ONRR data. We have analyzed the SNL data sources and methodology used by Headwaters to understand what the reasons were for this very large difference between the prices reported to ONRR and Headwater's "net delivered" mine price. Specifically, our questions were:

- 1) Is the difference in reported prices due to downstream profits realized by affiliated marketing companies and independent brokers, as alleged by Headwaters' or,
- 2) Is the difference in reported prices due to problems with the data and analysis and is there any difference once these problems are identified and corrected?

Replication of Headwaters Data and Analysis

Headwaters did not provide any detail as to the data which it relied upon and they aggregated the data across all deliveries and a period of 7 fiscal years. In order to perform a detailed analysis of all of the Montana coal shipments from federal leases, we had to recreate Headwaters' analysis

³⁰ Ibid.

using the methodology and data sources which were described in Appendix A to the May Report.

³¹ Specifically, the process described by Headwaters, which we repeated, was:

1. Use all monthly coal deliveries to the electric power sector for the period October 2007 to September 2014 (fiscal years which correspond to the ONRR data). These data were downloaded from SNL Financial in a database. The SNL data is the EIA Form 923 data, with SNL adding estimates for transportation costs and FOB mine prices (as well as delivered prices for unregulated generators which EIA does not disclose). In order to provide a detailed analysis by coal mine, we recreated the analysis for Fiscal Year 2014.
2. Match the data for all coal shipments originating from the state of Montana with the mine origin by MSHA ID number as reported on the SNL database. All of the records for Montana coal deliveries in 2014 had an MSHA ID number assigned to the delivery.
3. Calculate the average coal prices FOB mine and delivered by mine.

Following the same methodology as Headwaters, we have reproduced the same results. The average mine price for Montana coal in Fiscal Year 2014 for mines with federal leases using Headwaters' data and methodology is shown on Exhibit 3. **The apparent weighted average FOB mine price for all coal sales to the domestic power sector calculated using Headwaters' methodology was \$28.38 per ton. For the same Fiscal Year 2014, the average price reported to ONRR was \$17.18 per ton, confirming the very large difference found by Headwaters for the average over 7 years.**

³¹ Headwaters declined our request to share their calculations and underlying data and has only produced a table showing the totals for the 7-year period. However, we have reproduced their calculations for the 7-year period as well as for each fiscal year.

Exhibit 3: Calculation of Average Mine Price for Montana Federal Coal Leases, FY 2014 Using Headwaters Data and Methodology³²

Methodology Used by Headwaters Economics							
Deliveries (000 tons)						FOB Cost (\$/Ton)	
MT Mine	% Federal Lease	All Deliveries	Federal Leases	Delivered Price (\$/ton)	Transportation Cost (\$/ton)	All Deliveries	Federal Coal
Absaloka	0%	5,840	0	\$37.43	\$20.57	\$16.86	\$16.86
Decker	100%	758	758	\$30.46	\$17.71	\$12.74	\$12.74
Rosebud	100%	7,967	7,967	\$38.03	\$0.00	\$38.03	\$38.03
Savage	100%	63	63	\$25.17	\$5.38	\$19.79	\$19.79
Signal Peak	100%	144	144	\$77.87	\$26.07	\$51.80	\$51.80
Spring Creek	100%	5,490	5,490	\$36.06	\$20.03	\$16.02	\$16.02
Total	71%	20,262	14,422	\$37.22	\$8.84	\$25.06	\$28.38
Average Price Reported to ONRR			21,427				\$17.18

Error #1: Correction for the SNL Data Error for the Colstrip Power Plant

The largest customer for Montana coal delivered to the electric power sector is the Colstrip power plant. Colstrip is a mine-mouth plant located adjacent to the Rosebud coal mine and the coal is delivered by conveyor belt. All of the coal deliveries shown on Exhibit 3 from the Rosebud mine are to the Colstrip power plant, with \$0.00 per ton transportation cost. The very high mine price reported by SNL of \$38.03 for this one mine and plant is the major reason why the SNL/Headwaters mine average price is far above the price reported to ONRR.

The SNL price estimate for the Colstrip plant is wrong. Because the Colstrip plant is operated by a merchant generator, EIA does not publish the delivered coal price to preserve confidentiality. For merchant plants, SNL's procedure is to use the average delivered coal price for all coal (regardless of origin) delivered to the state reported by EIA in the Electric Power Monthly.³³ However, EIA withholds the average delivered coal price by state for independent power producers (merchant generators) where there are not enough power plants who report monthly data to prevent analysts from discovering the delivered price. EIA did not publish a monthly delivered coal price for the state of Montana in 2013 or 2014.³⁴ As a result, the price estimated by SNL for Colstrip is far above the actual price for coal delivered to Colstrip.

³² Deliveries to electric power sector and prices from SNL Financial. Mines with federal coal leases from BLM. Average price reported to ONRR FY 2014: <http://statistics.onrr.gov/ReportTool.aspx>

³³ Personal communication from Steve Piper, Director, Energy Research, SNL Energy on September 9, 2015.

³⁴ EIA, "Electric Power Monthly", Table 4.10. <http://www.eia.gov/electricity/monthly/>

There are other public sources of data which provide reliable estimates of the delivered cost of coal purchased by power plants. One of these sources is the Form 1, an annual report filed by regulated electric utilities with the Federal Energy Regulatory Commission (“FERC”). The Colstrip plant is co-owned by both regulated and unregulated power companies. The largest regulated owner is Puget Sound Energy, who owns 50% of Colstrip units 1-2 and 25% of units 3-4. Puget reports its cost of coal delivered to Colstrip units 1-2 and units 3-4 by calendar year.

While EIA does not report the monthly delivered price for independent power producers in Montana on the Electric Power Monthly, EIA does provide the average annual delivered coal price to all power plants in the state of Montana by coal type (subbituminous and lignite). Colstrip is by far the largest power plant in Montana and it receives 86% - 91% of the total subbituminous coal delivered to Montana each year. As a result, the annual reported delivered price for subbituminous coal to Montana is a close approximation of the (undisclosed) delivered price to Colstrip.

A comparison of the quantity and prices reported by SNL compared to the FERC Form 1 and EIA Montana data is shown on Exhibit 4. In most years, SNL’s estimate of the delivered price to Colstrip (which is the same as the Rosebud mine price) is far above the FERC and EIA data. The FERC and EIA data are very similar, reflecting the fact that these are accurate reported data sources, with the small differences due to the fact that EIA includes all subbituminous coal delivered to Montana, not just Colstrip.

Exhibit 4: Comparison of Delivered Coal Prices for the Colstrip Plant³⁵

	Calendar Year							
	2008	2009	2010	2011	2012	2013	2014	
FERC Form 1 Data								
Tons Burned								
Colstrip 1-2	50%	1,391,673	1,446,801	1,469,911	1,214,793	905,093	1,444,314	1,338,220
Colstrip 3-4	25%	1,884,759	1,338,982	1,785,698	1,430,462	1,509,826	1,267,303	1,527,867
Total		10,322,382	8,249,530	10,082,614	8,151,434	7,849,490	7,957,840	8,787,908
Delivered Price \$/ton								
Colstrip 1-2		\$15.86	\$17.40	\$21.75	\$29.40	\$37.15	\$29.52	\$29.32
Colstrip 3-4		\$16.30	\$18.49	\$16.76	\$21.14	\$19.91	\$23.50	\$22.37
Average		\$16.18	\$18.11	\$18.21	\$23.60	\$23.89	\$25.69	\$24.49
EIA Average Delivered Price of Subbituminous Coal to Montana								
Tons received		11,755,720	9,348,457	11,287,200	9,422,469	8,560,170	8,969,928	
Delivered price \$/ton		\$16.56	\$17.89	\$18.44	\$22.31	\$23.43	\$26.64	
SNL Energy Data								
Tons received		10,654,144	8,081,926	10,077,757	8,405,469	7,754,748	7,953,774	8,752,704
Delivered price \$/ton		\$25.30	\$21.69	\$25.92	\$23.29	\$24.94	\$37.65	\$37.76
Difference in Reported Prices (\$/ton)								
FERC vs. EIA		(\$0.38)	\$0.22	(\$0.23)	\$1.29	\$0.46	(\$0.95)	
SNL vs. FERC		\$9.12	\$3.58	\$7.71	(\$0.31)	\$1.05	\$11.96	\$13.27
SNL vs. EIA		\$8.74	\$3.80	\$7.48	\$0.98	\$1.51	\$11.01	

Correcting the large mistake in the SNL data for coal sales from the Rosebud mine substantially reduces the difference between the calculated “net delivered” price for coal sales to the power sector and the price reported to ONRR for Montana coal sales in FY 2014 as shown on Exhibit 5.

³⁵ Sources: Puget Sound Energy, FERC Form 1, 2008 – 2014; EIA Coal Data Browser at <http://www.eia.gov/beta/coal/data/browser/#/topic/45?agg=0,1&geo=00000000004&rank=5a&freq=A&start=2008&end=2013&ctype=map<ype=pin&rtype=s&pin=&rse=0&maptype=0>; SNL Energy Briefing Book, Colstrip plant at <https://www.snl.com/InteractiveX/PlantFuels.aspx?ID=2449>

Exhibit 5: Calculation of Average Mine Price for Montana Federal Coal Leases, FY 2014 Using Headwaters Data Corrected for Colstrip Price

Corrected Delivered Price for Rosebud Mine to Colstrip Power Plant							
MT Mine	% Federal Lease	Deliveries (000 tons)			FOB Cost (\$/Ton)		
		Deliveries (000 tons)	Federal Leases	Delivered Price (\$/ton)	Transportation Cost (\$/ton)	All Deliveries	Federal Coal
Absaloka	0%	5,840	0	\$37.43	\$20.57	\$16.86	\$16.86
Decker	100%	758	758	\$30.46	\$17.71	\$12.74	\$12.74
Rosebud	100%	7,967	7,967	\$24.79	\$0.00	\$24.79	\$24.79
Savage	100%	63	63	\$25.17	\$5.38	\$19.79	\$19.79
Signal Peak	100%	144	144	\$77.87	\$26.07	\$51.80	\$51.80
Spring Creek	100%	5,490	5,490	\$36.06	\$20.03	\$16.02	\$16.02
Total	71%	20,262	14,422	\$29.91	\$8.84	\$19.86	\$21.07
Average Price Reported to ONRR			21,427				\$17.18

Error #2: Correction for Missing SNL Data

Headwaters relied upon SNL data to estimate the average mine price for Montana coal. The SNL data only includes coal sales to the domestic power sector, which only accounts for 59.2% of Montana coal sales, as shown on Exhibit 2 earlier. However, SNL does not even include all of the sales to the electric power sector. SNL excluded almost all sales to the second-largest customer of Montana coal, Detroit Edison (“DTE”), because DTE reported the coal delivered to the common storage area for the Belle River and St. Clair power plants (reported on the EIA Form 923 as “BRSC Shared Storage”), rather than to the plants themselves.³⁶ Also, the 2014 SNL data used by Headwaters does not include coal deliveries to plants (Stanton, Hoot Lake, and Savage) which only report annually, rather than monthly. As a result, the SNL data used by Headwaters only included 47.3% of the Montana sales to the electric power sector in FY 2014, as shown on Exhibit 6.

Exhibit 6: Total Montana Coal Production and Sales to the Power Sector Reported by SNL, FY 2014 (1000 tons)³⁷

Mine	Total Produced	SNL Data	Percent Reported	Missing from SNL		Corrected Data
				Detroit Edison	Annual Reporting	
Absaloka	6,416	5,840	91%			5,840
Decker	3,308	758	23%	2,632		3,390
Rosebud	8,232	7,967	97%			7,967
Savage	340	63	19%		203	266
Signal Peak	7,501	144	2%			144
Spring Creek	17,014	5,490	32%	3,968	821	10,279
Total	42,811	20,262	47%	6,600	1,024	27,886

³⁶ Personal communication from Steve Piper, Director, SNL Energy on September 9, 2015.

³⁷ Total production from MSHA Form 7000-2 data; sales missing from SNL from EIA Form 923.

All of the Montana coal sales to DTE, Stanton and Hoot Lake came from the Decker and Spring Creek mines, which had the SNL's lowest reported "net delivered" mine prices in Montana. By excluding these coal sales, the net result was to increase the weighted average price for Montana coal sales.

The price for the missing coal sales data to DTE can be determined from the reported delivered prices on EIA Form 923 and the average FOB mine price for Decker from the reported financial statements for Cloud Peak Energy ("CPE"). CPE owned 50% of Decker Coal Company until it sold this share to its partner, Ambre Energy (now renamed Lighthouse Resources) on September 12, 2014. CPE published the financial statements for Decker in its quarterly filings with the SEC as footnote 22 to its consolidated financial statements in its Form 10-Q (supplemental guarantor/non-guarantor financial statements). The statement of operations for CPE's non-guarantor subsidiaries is the Decker financial results. The quarterly operating revenues and income statements for Fiscal Year 2014 for Decker Coal Company and the average sales price are shown on Exhibit 7.

Exhibit 7: Decker Coal Financial Statements and Sales Prices FY 2014³⁸

	2013 Q4	2014 Q1	2014 Q2	2014 Q3	FY 2014
Revenue	\$ 6,805	\$ 3,965	\$ 5,592	\$ 6,095	\$ 22,457
Costs and expenses					
Cost of product sold	5,690	5,174	6,736	5,932	23,532
Depreciation and depletion	(5,939)	(218)	(22)	(929)	(7,108)
Accretion	456	1,016	1,016	771	3,259
	207	5,972	7,730	5,774	19,683
Operating income	6,598	(2,007)	(2,138)	321	2,774
Tons sold	483	272	385	422	1,562
Revenues per ton	\$14.09	\$14.58	\$14.52	\$14.44	\$14.38

These average sales prices were used for the sales price to DTE, since DTE sales accounted for 77% of the total Decker sales. Using the reported delivered price from the EIA Form 923 and the Decker sales price FOB mine allowed the calculation of the freight costs from Decker to DTE. These freight costs were applied to the receipts reported by DTE from the Spring Creek mine to estimate the FOB mine price for Spring Creek sales to DTE for the same period. The "net

³⁸ Financial statements from Cloud Peak Energy SEC Forms 10-Q 2013 and 2014 and Form 10-K 2014. Sales tonnage from Cloud Peak Energy quarterly earnings releases at www.cloudpeakenergy.com

delivered” prices for sales to plants which had reported freight costs by SNL in prior years was determined by using the prior SNL freight estimates. **Adjusting the SNL data used by Headwaters for the sales which were missing from the SNL database results in a lower average price for Montana coal sales, as shown on Exhibit 8. The average sales price for FY 2014 is just \$0.61 per ton higher than the price reported to ONRR.**

Exhibit 8: Average Mine Price for Montana Federal Coal Leases, FY 2014 Using Headwaters Data Corrected for Colstrip Price and Missing SNL Data

Adjusted Deliveries to Correct for Missing Sales Data							
MT Mine	% Federal Lease	Deliveries (000 tons)			FOB Cost (\$/Ton)		
		Deliveries (000 tons)	Federal Leases	Delivered Price (\$/ton)	Transportation Cost (\$/ton)	All Deliveries	Federal Coal
Absaloka	0%	5,840	0	\$37.43	\$20.57	\$16.86	\$16.86
Decker	100%	3,390	3,390	\$38.10	\$24.08	\$13.99	\$13.99
Rosebud	100%	7,967	7,967	\$24.79	\$0.00	\$24.79	\$24.79
Savage	100%	266	266	\$25.17	\$5.38	\$19.79	\$19.79
Signal Peak	100%	144	144	\$77.87	\$26.07	\$51.80	\$51.80
Spring Creek	100%	17,191	17,191	\$28.11	\$13.50	\$14.97	\$14.97
Total	83%	34,798	28,958	\$28.59	\$11.01	\$17.63	\$17.79
Average Price Reported to ONRR			21,427				\$17.18

Error #3: Correction for the Share of Montana Coal Production from Federal Leases

In its analysis, Headwaters assumed that any mine which had a federal coal lease had all of its production from federal coal. This assumption is false. None of these mines produces exclusively from federal leases. These mines have state leases and private leases also. For federal lands, 1 out of every 18 sections is owned by the state. Because the mines which have a higher FOB mine price (Signal Peak and Rosebud) have a lower share of coal produced from federal leases, Headwaters’ assumption that all of the coal from these mines was produced from federal coal leads Headwaters to calculate a higher average mine price than would be calculated using the correct share of coal production from federal leases.³⁹

The Signal Peak (Bull Mountains) mine only acquired its first federal lease on June 1, 2012.⁴⁰ As shown in the environmental assessment prepared in support of this lease, Signal Peak’s mine plan

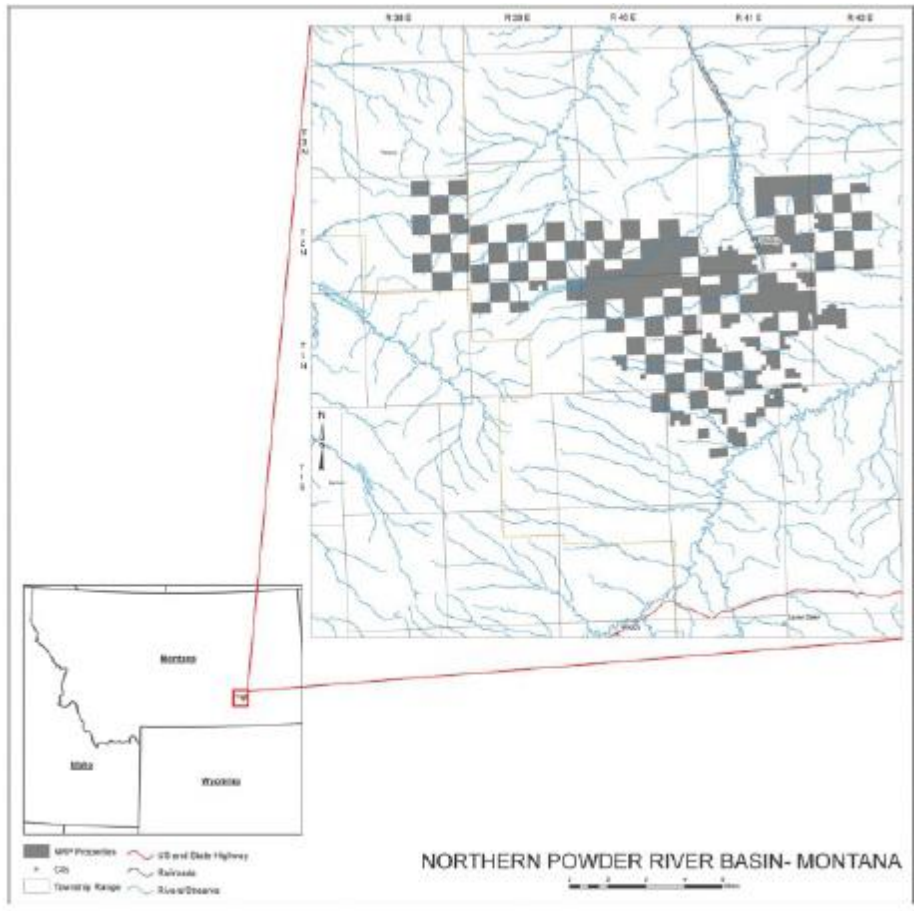
³⁹ Consistent with Headwaters’ calculations, the Absaloka mine produces no federal coal (it is 100% Indian coal).

⁴⁰ See <http://www.blm.gov/mt/st/en/prog/energy/coal/tables.html>.

would not produce coal from the new federal lease until the end of 2014,⁴¹ so none of the Signal Peak coal production was from federal coal during the entire period studied by Headwaters from 2008 to 2014. As this is the highest-priced coal in Montana, this assumption caused Headwaters to overstate the average Montana coal price throughout the period.

Headwaters has also overstated the amount of federal coal produced from the Rosebud mine, which has the second-highest coal sales price in Montana. The Rosebud mine has “checkerboard” coal leases, with alternating sections leased from the federal government and a private entity (Natural Resource Partners (“NRP”), which acquired the Burlington Northern railroad coal properties). NRP shows the extent of its coal leases at the Westmoreland Rosebud mine (“Western Energy”) in its 10-K, as shown on Exhibit 9.

Exhibit 9: NRP Coal Leases at the Rosebud Mine⁴²



⁴¹ U.S. Bureau of Land Management, “Environmental Assessment Bull Mountains Mine No. 1”, April 2011. <http://www.blm.gov/mt/st/en/prog/energy/coal.html>

⁴² Natural Resource Partners, SEC Form 10-K, 2014, page 13.

The share of coal produced at the Rosebud mine from its federal leases can be estimated from the amount of leased coal production reported by NRP. For FY 2014, NRP reported leased coal production of 2,385,000 tons out of 8,232,258 tons total production.⁴³ Assuming the remainder of the coal was 17/18 federal coal and the remainder state leases (Westmoreland reports that the mine has state leases⁴⁴), the federal coal share at Rosebud was 67%. Cloud Peak reported that the 2014 coal production at the Spring Creek mine was 78% federal coal (the remainder was from state leases).⁴⁵ We have estimated the shares of federal production from Decker to be 94% (federal and state leases) and from Savage to be 50% (mostly private coal).

Correcting the production for the share of coal produced from federal leases, the total federal production and the average mine price are very close to the values reported by ONRR (within \$0.06 per ton), as shown on Exhibit 10. Thus, properly analyzed, the “net delivered” mine prices for Montana coal do not show any additional revenues which are not subject to royalties, as alleged by Headwaters.

Exhibit 10: Average Mine Price for Montana Federal Coal Leases, FY 2014 Using Headwaters Data Corrected for Colstrip Price, Missing SNL Data, and Federal Coal Lease Share

Corrected for Share of Coal Produced from Federal Leases							
MT Mine	% Federal Lease	Deliveries (000 tons)			FOB Cost (\$/Ton)		
		Deliveries (000 tons)	Federal Leases	Delivered Price (\$/ton)	Transportation Cost (\$/ton)	All Deliveries	Federal Coal
Absaloka	0%	5,840	0	\$37.43	\$20.57	\$16.86	\$16.86
Decker	94%	3,390	3,202	\$38.10	\$24.08	\$13.99	\$13.99
Rosebud	67%	7,967	5,344	\$24.79	\$0.00	\$24.79	\$24.79
Savage	50%	266	133	\$25.17	\$5.38	\$19.79	\$19.79
Signal Peak	0%	144	0	\$77.87	\$26.07	\$51.80	\$51.80
Spring Creek	78%	17,191	13,409	\$28.11	\$13.50	\$14.97	\$14.97
Total	63%	34,798	22,088	\$28.74	\$11.72	\$17.63	\$17.24
Average Price Reported to ONRR			21,427				\$17.18

V. SNL’s Estimates of Freight Costs Overstate the Net Mine Price

The predicate of Headwaters’ use of SNL’s mine price data is that SNL provides an accurate estimate of the “net delivered price” to the electric power sector (the delivered price reported by the power companies on EIA Form 923 less the cost of freight).⁴⁶ However, SNL’s methodology

⁴³ Natural Resource Partners, SEC Forms 10-Q 2013 and 2014 and 2013 Form 10-K.

⁴⁴ Westmoreland Coal Company, SEC Form 10-K, 2014, page 13.

⁴⁵ Personal communication from Tom Nelson, August 28, 2015.

⁴⁶ The SNL data does not include sales to industrial customers or export markets at all.

persistently and significantly under-estimates the difference between the reported delivered price and the mine price, leading SNL to over-estimate the FOB mine price. **Once the problems with SNL's estimates are corrected, there is no basis to conclude that the FOB mine prices reported to ONRR are less than the actual price at which the coal is sold.**

EIA collects data on the cost and quality of fuels on Form 923. For the cost of coal, Form 923 collects two types of cost data: the total delivered cost and the commodity cost for each delivery of coal every month. The reporting instructions for the Form 923 define these costs as follows:

- **“Total Delivered Cost (all fuels):** Enter the delivered cost of the fuel in cents per million Btu (MMBtu) to the nearest 0.1 cent. Include all costs incurred in the purchase and delivery of the fuel to the plant. Do not include adjustments associated with prior months' fuel costs....For coal, include maintenance and depreciation costs of coal delivered in railcars owned by the plant. Do not include unloading costs.”
- **“Commodity Cost (for coal, petroleum coke, and natural gas):** Report the cost (in cents per million Btu rounded to the nearest 0.1 cent) at the point of first loading (free on board mine or transportation pipeline (FOB)), including taxes and quality-related charges or credits. Do not include loading and unloading charges, dust proofing, freeze conditioning, switching charges, diesel fuel surcharges, pipeline charges, transportation charges, or any other charges relating to the movement of the fuel to the point of use.”⁴⁷

While EIA collects the FOB mine price data for each coal delivery to the electric power sector, it does not disclose the FOB mine price for these sales, or even the delivered price for coal receipts at nonutility (merchant) power plants.⁴⁸ Thus, SNL must estimate the FOB mine prices using the delivered cost for regulated power plants. For unregulated power plants, SNL uses the average delivered coal price for all coal deliveries by destination state, published by EIA in the Electric Power Monthly.

SNL's methodology to estimate the FOB mine price is to take the reported “total delivered cost” (converted from cents per million Btu to dollars per ton) and to subtract an estimated transportation cost (in dollars per ton). For Montana and Wyoming coal, the vast majority of the coal is shipped by rail (with some coal transferred from rail to barge, vessel or truck for final delivery). SNL describes its transportation cost estimation methodology for estimating rail transportation rates as follows:

⁴⁷ EIA, “Form EIA-923 Power Plant Operations Report Instructions”. <http://www.eia.gov/survey/>

⁴⁸ Id, page 38.

- Collect data from the Public Use Waybill file, which has a time lag of two years, which reveals the rail rate charged by origin area and termination area.⁴⁹
- Based upon the billed freight revenue and billed weight, calculate the rail rate per ton of coal and the route length in miles.
- Derive a formula of rail rate per ton-mile as a function of rail distance for all of the annual Waybill data.
- Estimate the rail rate for each shipment based on the mileage of the rail distance.
- Adjust the rail rate quarterly based upon the changes in the Rail Cost Adjustment Factor filed with the Association of American Railroads and changes in fuel surcharges reported by the railroads.

What is clear is that the “total delivered cost” which EIA requires to be reported on the Form 923 includes costs beyond the commodity price FOB mine and the rail rate charged by the rail carrier. As is stated in EIA’s instructions, the total delivered cost includes the following items specifically excluded from the FOB mine cost, which are not included in the rail rates reported by the rail carriers on the Waybill data:

- Maintenance and depreciation costs for railcars owned by the plant (which includes virtually all customers purchasing Montana and Wyoming coal);
- Sales taxes charged by many states on the cost of coal (at a minimum the states with sales taxes on the cost of coal include Arizona, Georgia, Illinois, Louisiana and Washington); and,
- Freeze conditioning and dust proofing additives.

SNL does not subtract these costs in estimating the FOB mine price and therefore systematically overstates the FOB mine price in its database (even if all of its rail rate estimation methodology were accurate).

This systematic error can be shown by a comparison of the SNL transportation estimates with a report published by EIA annually on the coal transportation costs by state of origin to state of destination. While Headwaters relied upon this EIA study in its January Report (Appendix B) and referred to the EIA study in its May Report⁵⁰, Headwaters relied upon the SNL data in its May

⁴⁹ The areas are the Bureau of Economic Analysis Economic Area.

⁵⁰ Headwaters May Report, footnote 12, at 8.

Report, not the EIA data, and never compared the results of the EIA transportation data with the SNL data. We have made this comparison.

The EIA study calculated the transportation costs by subtracting the reported commodity price FOB mine from the total delivered costs. For reasons of confidentiality, EIA did not disclose the detailed data, but aggregated the data by state of origin, state of destination, and primary mode of shipment (rail, barge or truck). EIA even withheld many of the state origin-destination pairs to preserve confidentiality for individual customers, where states had few customers purchasing coal from a state. Thus, the EIA data included all costs reported in the total delivered price, including taxes, rail cars and other costs, which SNL did not include. We have calculated the average transportation costs reported by SNL for coal originating in Wyoming and Montana by state of destination with the EIA reported costs for the same shipments for the years 2008 – 2012 (the only years reported by EIA). Exhibit 11 shows the results of this analysis.

Exhibit 11: Comparison of Transportation Costs reported by SNL and EIA for Wyoming and Montana Coal⁵¹

Coal State	Dest. State	SNL Data, Adjusted to 2012 \$/ton					EIA Data, Constant 2012 \$/ton					\$/ton Difference (SNL minus EIA)				
		2008	2009	2010	2011	2012	2008	2009	2010	2011	2012	2008	2009	2010	2011	2012
WY	AL	\$13.65	\$12.58	\$13.29	\$14.33	\$17.03	W	W	W	W	W	W	W	W	W	W
WY	AR	\$16.77	\$16.17	\$14.14	\$15.80	\$21.77	W	\$18.80	\$18.95	\$20.82	\$21.47	W	(\$2.63)	(\$4.81)	(\$5.02)	\$0.30
WY	AZ	\$18.44	\$17.40	\$15.93	\$17.88	\$21.65	\$23.08	W	W	W	\$24.37	(\$4.64)	W	W	W	(\$2.72)
WY	CO	\$10.63	\$12.01	\$9.75	\$10.52	\$15.35	\$12.01	\$11.94	\$11.92	\$12.73	\$13.23	(\$1.38)	\$0.07	(\$2.17)	(\$2.21)	\$2.12
WY	GA	\$20.34	\$19.31	\$20.32	\$22.83	\$23.33	W	W	W	W	W	W	W	W	W	W
WY	IA	\$11.41	\$12.17	\$11.95	\$13.20	\$14.94	\$10.78	\$10.20	\$10.50	\$10.80	\$10.97	\$0.63	\$1.97	\$1.45	\$2.40	\$3.97
WY	IL	\$15.88	\$18.98	\$13.97	\$14.85	\$19.11	\$15.81	\$15.44	\$16.35	\$16.52	\$19.14	\$0.07	\$3.54	(\$2.38)	(\$1.67)	(\$0.03)
WY	IN	\$17.25	\$15.68	\$15.05	\$20.30	\$17.22	\$23.77	\$20.99	\$21.05	\$30.66	\$30.11	(\$6.52)	(\$5.31)	(\$6.00)	(\$10.36)	(\$12.89)
WY	KS	\$14.22	\$13.94	\$14.02	\$15.47	\$18.27	\$14.40	\$13.81	\$14.75	\$18.03	\$18.40	(\$0.18)	\$0.13	(\$0.73)	(\$2.56)	(\$0.13)
WY	KY	\$18.40	\$17.23	\$14.28	\$17.35	\$21.37	\$24.52	W	W	W	W	(\$6.12)	W	W	W	W
WY	LA	\$21.88	\$24.10	\$20.26	\$20.70	\$22.95	W	W	W	W	W	W	W	W	W	W
WY	MD	\$29.18	\$30.80	\$25.66	\$28.27	\$38.93	W	W	W	W	W	W	W	W	W	W
WY	MI	\$17.41	\$18.75	\$16.93	\$21.10	\$27.29	\$19.52	\$19.46	\$19.70	\$31.70	\$35.08	(\$2.11)	(\$0.71)	(\$2.77)	(\$10.60)	(\$7.79)
WY	MN	\$17.16	\$16.27	\$13.80	\$15.84	\$21.33	\$18.57	\$19.02	\$21.32	\$21.97	\$21.66	(\$1.41)	(\$2.75)	(\$7.52)	(\$6.13)	(\$0.33)
WY	MO	\$14.54	\$13.90	\$12.52	\$14.49	\$18.20	\$15.76	\$13.43	\$14.52	\$17.06	\$18.54	(\$1.22)	\$0.47	(\$2.00)	(\$2.57)	(\$0.34)
WY	MS	\$17.34	\$20.75	\$21.63	\$25.78	\$27.71	W	W	W	W	W	W	W	W	W	W
WY	MT	\$9.40	\$10.96	\$8.04	\$8.81	\$13.59	W	W	W	W	W	W	W	W	W	W
WY	ND	\$14.86	\$13.78	\$12.42	\$13.60	\$17.92	W	W	W	W	W	W	W	W	W	W
WY	NE	\$8.83	\$11.07	\$10.39	\$11.61	\$14.87	\$8.62	\$10.41	\$11.28	\$11.95	\$14.35	\$0.21	\$0.66	(\$0.89)	(\$0.34)	\$0.52
WY	NV	\$9.33	\$14.47	\$12.85	\$14.55	\$17.80	W	\$25.40	\$30.00	\$30.10	\$23.99	W	(\$10.93)	(\$17.15)	(\$15.55)	(\$6.19)
WY	NY	\$22.94	\$28.46	\$23.24	\$25.82	\$29.40	W	W	W	W	W	W	W	W	W	W
WY	OH	\$21.27	\$22.58	\$20.59	\$23.56	\$26.08	\$28.91	\$26.87	\$32.08	\$36.19	\$40.74	(\$7.64)	(\$4.29)	(\$11.49)	(\$12.63)	(\$14.66)
WY	OK	\$14.04	\$15.88	\$14.59	\$15.49	\$19.98	\$14.30	\$19.02	\$18.50	\$18.90	\$21.03	(\$0.26)	(\$3.14)	(\$3.91)	(\$3.41)	(\$1.05)
WY	OR	\$15.10	\$15.53	\$16.81	\$17.68	\$18.62	W	W	W	W	W	W	W	W	W	W
WY	SD	\$17.20	\$16.78	\$14.05	\$14.61	\$21.66	W	W	W	W	W	W	W	W	W	W
WY	TN	\$15.97	\$18.07	\$17.72	\$19.50	\$22.54	\$24.91	\$22.21	\$23.37	\$27.02	\$29.51	(\$8.94)	(\$4.14)	(\$5.65)	(\$7.52)	(\$6.97)
WY	TX	\$16.44	\$16.17	\$15.21	\$16.79	\$18.60	\$14.70	\$15.11	\$20.93	\$21.25	\$20.11	\$1.74	\$1.06	(\$5.72)	(\$4.46)	(\$1.51)
WY	WA	\$16.64	\$16.69	\$14.05	\$15.81	\$24.08	W	W	W	W	W	W	W	W	W	W
WY	WI	\$15.99	\$16.47	\$15.72	\$18.02	\$22.43	\$19.97	\$20.36	\$20.74	\$25.89	\$24.99	(\$3.98)	(\$3.89)	(\$5.02)	(\$7.87)	(\$2.56)
WY	WV	\$22.29	\$21.76	\$23.10	\$30.42	\$38.10	W	W	W	W	W	W	W	W	W	W
WY	WY	\$3.79	\$4.07	\$3.58	\$3.95	\$4.60	\$7.14	\$5.87	\$5.40	\$5.57	\$5.71	(\$3.35)	(\$1.80)	(\$1.82)	(\$1.62)	(\$1.11)
Wt. Average		\$14.42	\$15.02	\$13.47	\$15.01	\$18.10	\$15.87	\$15.34	\$16.87	\$18.66	\$19.20	(\$1.45)	(\$0.32)	(\$3.41)	(\$3.65)	(\$1.10)
MT	AZ	\$18.93	\$18.71	\$17.12	\$18.97	\$20.76	W	W	W	W	W	W	W	W	W	W
MT	MI	\$13.47	\$15.46	\$16.14	\$18.61	\$19.71	\$16.23	\$12.68	\$13.72	\$27.01	\$29.94	(\$2.76)	\$2.78	\$2.42	(\$8.40)	(\$10.23)
MT	MN	\$14.35	\$14.43	\$12.67	\$14.18	\$17.88	\$14.57	\$16.34	\$16.61	\$18.73	\$17.94	(\$0.22)	(\$1.91)	(\$3.94)	(\$4.55)	(\$0.06)
MT	MT	\$0.40	\$0.74	\$0.48	\$0.49	\$0.69	W	W	W	W	W	W	W	W	W	W
MT	ND	\$13.00	\$12.54	\$11.66	\$12.47	\$18.73	W	W	W	W	W	W	W	W	W	W
MT	OH	\$22.31	\$24.27	\$16.23	\$18.30	\$27.07	\$48.95	\$41.98	\$34.73	W	W	(\$26.64)	(\$17.71)	(\$18.50)	W	W
MT	WA	\$16.14	\$16.37	\$13.89	\$15.63	\$24.38	W	W	W	W	W	W	W	W	W	W
MT	WI	\$20.94	\$18.83	\$17.22	\$19.48	\$26.39	W	W	W	\$30.60	W	W	W	W	(\$11.12)	W
WA >>		\$13.99	\$15.14	\$14.63	\$16.80	\$19.12	\$15.63	\$15.00	\$16.33	\$23.68	\$26.08	(\$1.64)	\$0.14	(\$1.70)	(\$6.88)	(\$6.96)

Including only the data not withheld by EIA for confidentiality, this comparison shows that SNL’s estimate of transportation costs was significantly below EIA’s data for almost all states in almost all years. For the period 2008 – 2012, the weighted average difference for Wyoming coal was \$2.02 per ton and for Montana coal was \$3.08 per ton. **This error means that Headwaters overstated the “net delivered” mine prices for these states by this amount, which explains almost the entire difference in prices for Wyoming coal reported to ONRR compared to Headwaters’ calculation. Headwaters incorrectly attributed the price difference to “marketing**

⁵¹ EVA analysis of SNL data downloaded from SNL’s website, adjusted to constant 2012 dollars to match the EIA data, and EIA, “Coal Transportation Rates to the Electric Power Sector”, Tables 4a, 4b and 4c. <http://www.eia.gov/coal/transportationrates/>

margins” which affiliated and non-affiliated brokers earned on remarketing federal coal at higher prices and avoiding royalties.⁵²

VI. Experience and Qualifications

EVA is a market research and analysis company which was founded in 1981. EVA specializes in market analysis of the North American energy markets, including coal, natural gas, oil, and electric power. EVA’s clients include producers, consumers and transporters of coal, as well as investors and banks. EVA also performs market analyses for federal administrative and regulatory agencies, such as the Energy Information Administration and the Office of Surface Mining as well as state agencies such as public utility commissions.

The primary author of this report is Mr. Seth Schwartz, president of EVA. EVA has been performing analyses of U.S. energy markets since its founding in 1981. EVA analyzes and publishes regular reports on the coal, natural gas and power markets, including forecasts of supply, demand and prices. Mr. Schwartz leads EVA’s practice analyzing U.S. coal markets. He has testified as an expert witness on coal markets in numerous court, arbitration and regulatory hearings, including:

- Supreme Court of the United States (Wyoming v. Oklahoma, 1992)
- Federal district courts in Pennsylvania, Virginia, Missouri, Indiana, Kentucky, Florida, Ohio, Alabama, and West Virginia;
- State courts in Virginia, Kentucky, Pennsylvania, Colorado, Wyoming, Texas and West Virginia;
- U.S. bankruptcy courts in Delaware, Kentucky, Missouri, Tennessee and Louisiana; and,
- Regulatory hearings of the Surface Transportation Board, the Federal Energy Regulatory Commission and public utility commissions in the states of Utah, Texas, Florida, Georgia, and Ohio.

Mr. Schwartz has been a member of the Working Group for the Annual Energy Outlook prepared by the U.S. Energy Information Administration and testified at FERC’s Technical Conference on Environmental Regulations and Electric Reliability, Wholesale Electricity Markets, and Energy Infrastructure regarding the Clean Power Plan proposed rule. Mr. Schwartz gives presentations on coal markets at numerous industry conferences, for private energy companies and for EIA.

⁵² Headwaters January Report at 3.

ATTACHMENT 9



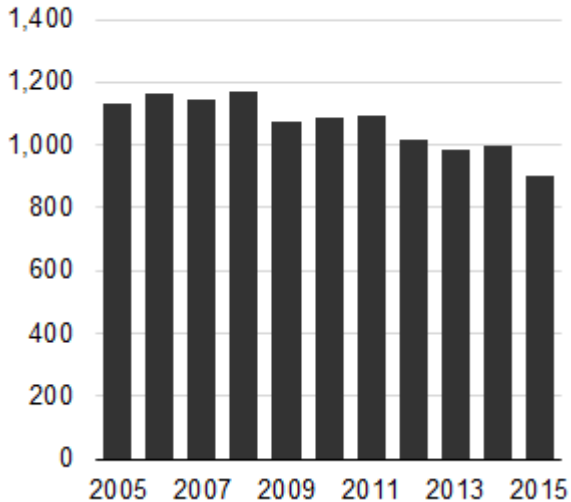
Today in Energy

January 8, 2016

Coal production and prices decline in 2015

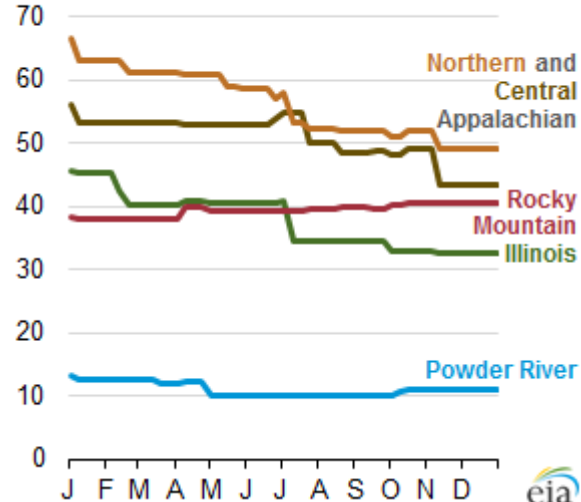
U.S. coal production, 2005-15

million short tons



Weekly spot steam coal prices in 2015

dollars per short ton



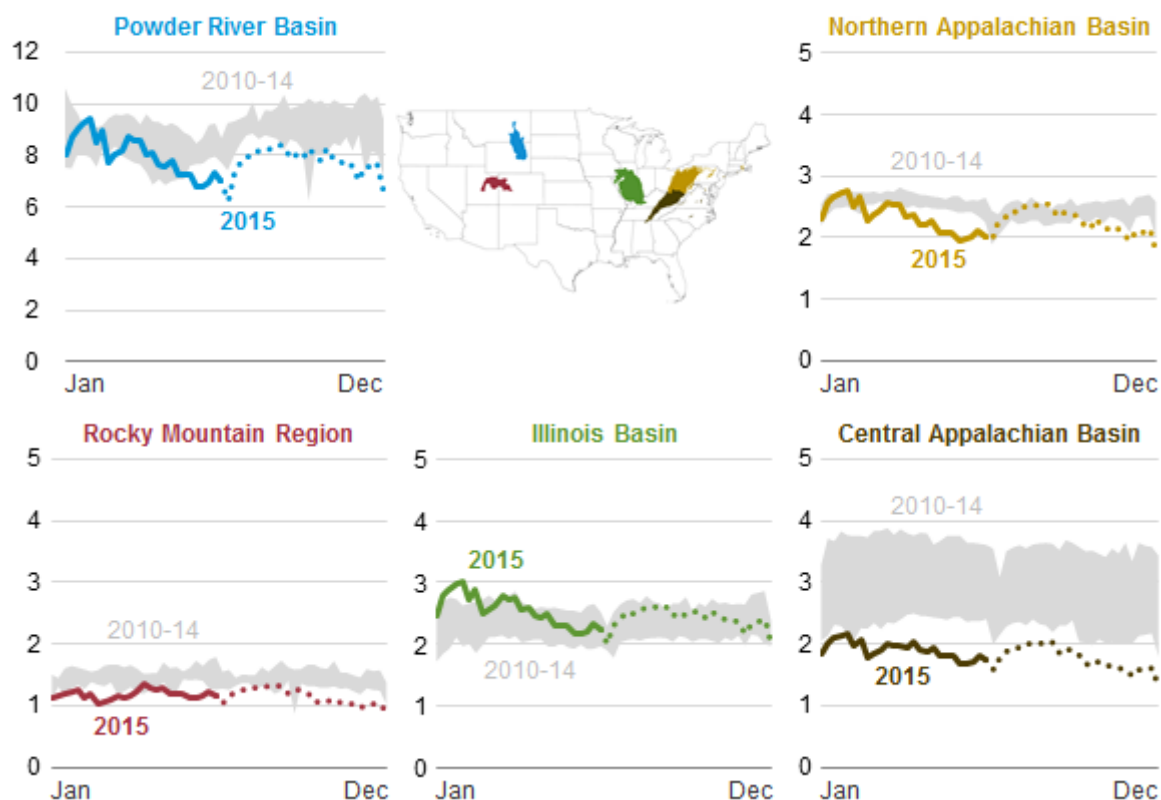
Source: U.S. Energy Information Administration, [Coal Data Browser](#)

Note: Production data for 2015 include estimated December 2015 production.

Since reaching a high point in 2008, coal production in the United States has continued to decline. U.S. coal production in 2015 is expected to be about 900 million short tons (MMst), 10% lower than in 2014 and the lowest level since 1986. Regionally, production from the Appalachian Basin has fallen the most. Low natural gas prices, lower international coal demand, and environmental regulations have contributed to declining U.S. coal production.

Weekly coal production by basin, 2015 vs. 2010-14 range

million short tons



Source: U.S. Energy Information Administration, Weekly Coal Production, based on Mine Safety and Health Administration data
Note: Data for July 2015 through December 2015 are EIA estimates.

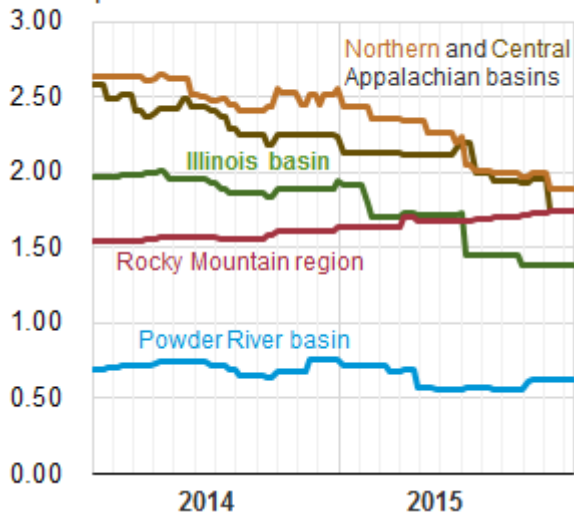
The United States has five major basins or regions that produce coal. The largest decline in coal production was in the Central Appalachian Basin, largely because of its difficult mining geology and high operating costs. Coal production in the Central Appalachian Basin in 2015 was 40% below its annual average level over 2010-14. In three other main areas, the Northern Appalachian Basin, Rocky Mountain region, and Powder River Basin, production in 2015 was 10% to 20% below their corresponding regional annual average levels over 2010-14. By contrast, coal production from the Illinois Basin in 2015 was 8% higher than production levels over 2010-14.

In the United States, almost all coal is used to generate electricity. Recently, coal's share of electricity generation has fallen as its market share of natural gas and renewables increased. The average daily natural gas spot price at the Henry Hub, a key natural gas benchmark, fell from \$4.38 per million British thermal units (MMBtu) in 2014 to \$2.61/MMBtu in 2015, resulting in greater natural gas-fired electricity generation. In April 2015, natural gas-fired electricity generation surpassed that of coal-fired generation on a monthly basis for the first time in history, and it did so again in each of the months from July through at least October, the latest monthly data available. The most recent [Short-Term Energy Outlook](#) estimates that 2015 power sector coal consumption will be about 764 MMst, the lowest level since 1988.

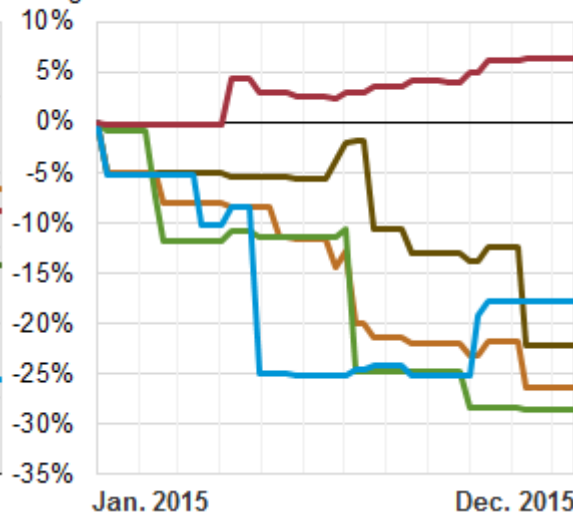
U.S. coal exports also declined in 2015, especially to major coal export destinations such as Europe and China. Although 15.7 MMst of coal was exported to the United Kingdom and Italy in 2014, only about half that volume is expected in 2015, when complete data are available. China, the world's largest coal consumer, is traditionally a large market for international coal trade, and China imported 8.3 MMst from the United States in 2013, about 7% of total U.S. coal exports that year. In 2014, U.S. coal exports to China decreased to 1.8 MMst, and the 2015 total is expected to be less than 0.5 MMst. Based on U.S. Census Bureau data through September 2015 and estimates for the remainder of the year, EIA expects the United States to export a total of 77 MMst of coal in 2015, a 21% decline from the previous year.

U.S. weekly spot steam coal prices by basin

dollars per MMBtu



change relative to first week of 2015

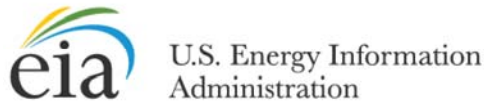


Source: U.S. Energy Information Administration, [Coal Data Browser](#)

With the exception of the Rocky Mountain region, steam coal prices in major basins experienced double-digit percentage declines in 2015. Central Appalachian coal continued to be economically challenged compared with natural gas for electricity generation, and average steam coal spot prices dropped by another 22% in 2015, following a decline of 13% the year before. Coal prices in the Powder River, Illinois, and North Appalachian basins, which had remained largely unchanged during 2014, decreased 18%, 26%, and 29%, respectively, in 2015.

Principal contributor: Brian Park

ATTACHMENT 10



Coal

Quarterly Coal Report (Abbreviated)

Release Date: June 15, 2016 | **Next Release Date:** September 14, 2016 |

[Previous Quarterly Coal Data](#)

historical data (PDF):

Note: On March 21, 2016, EIA replaced the Q4 2014 Quarterly Coal Report (Abbreviated) with the full Q4 2014 Quarterly Coal Report which also includes coal consumption, stocks, quality, receipts, and price data. The full report is available in the Previous Quarterly Coal Data historical section.

EIA continues to process Q1 2015, Q2 2015, Q3 2015, and Q4 2015 data and is currently collecting Q1 2016 data. Until these quarters are fully processed and released, the data tables sourced from the EIA-3 (which now includes the former EIA-5) are grayed out in the table listed to the right.

When all prior data have been collected and analyzed, EIA will publish full Quarterly Coal Reports for Q1 2015, Q2 2015, Q3 2015, Q4 2015, and Q1 2016.

The Quarterly Coal Report (Abbreviated) provides detailed quarterly data on U.S. coal production, exports, and imports. All data for 2014 and prior years are final. All data for 2015 and 2016 are preliminary.

Highlights for first quarter 2016:

- U.S. coal production during first quarter 2016 totaled 173.0 million short tons. This was 16.6% lower than the previous quarter and 28.0% lower than first quarter 2015. Production in the Western Region, which represented about 53.1% of total U.S. coal production in first quarter 2016, totaled about 91.8 million short tons (30.8% lower than first quarter 2015).

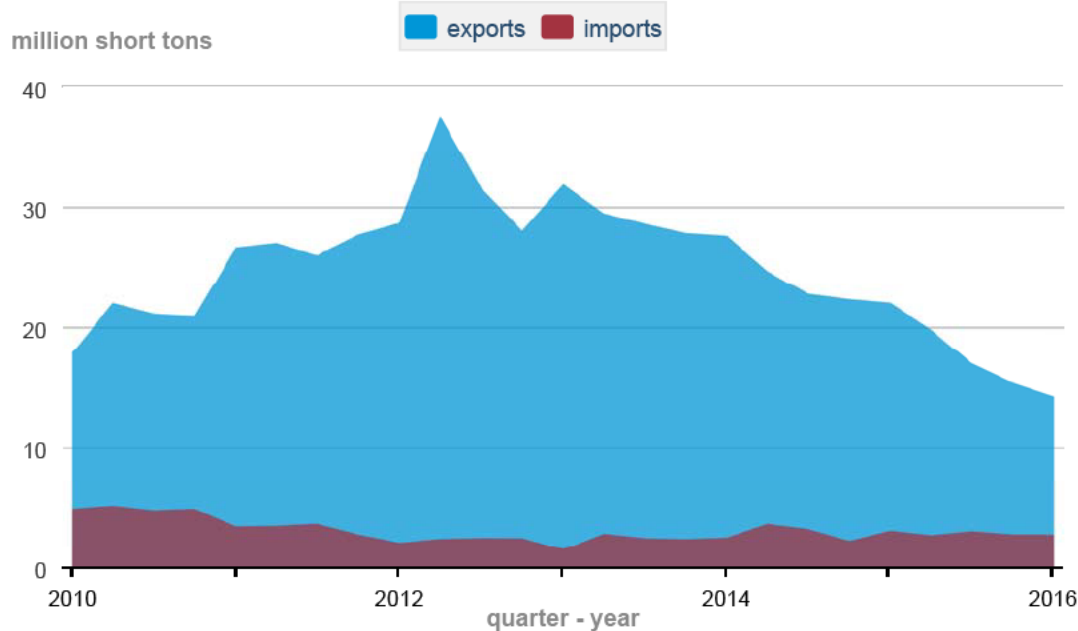
U.S. coal production by quarter

million short tons



- First quarter 2016 U.S. coal exports (14.2 million short tons) decreased 7.5% from fourth quarter 2015 and decreased 35.6% from first quarter 2015. Coal exports have declined for twelve quarters in a row. The average price of U.S. coal exports during the first quarter 2016 was \$61.41 per short ton.
- The United States continued to import coal primarily from Colombia (81.2%), Canada (8.9%), and Indonesia (7.4%). U.S. coal imports in first quarter 2016 totaled 2.7 million short tons. The average price of U.S. coal imports during the first quarter 2016 was \$63.97 per short ton.

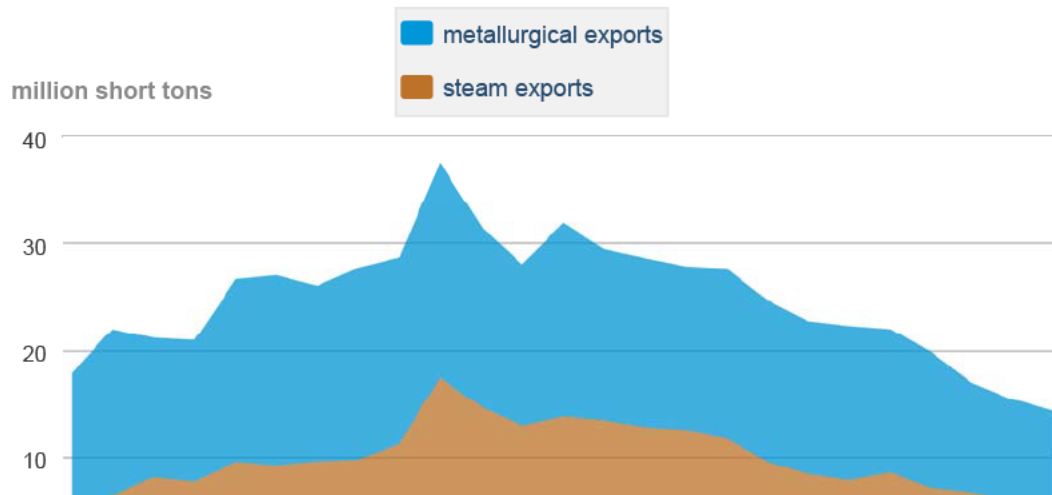
U.S. coal exports and imports



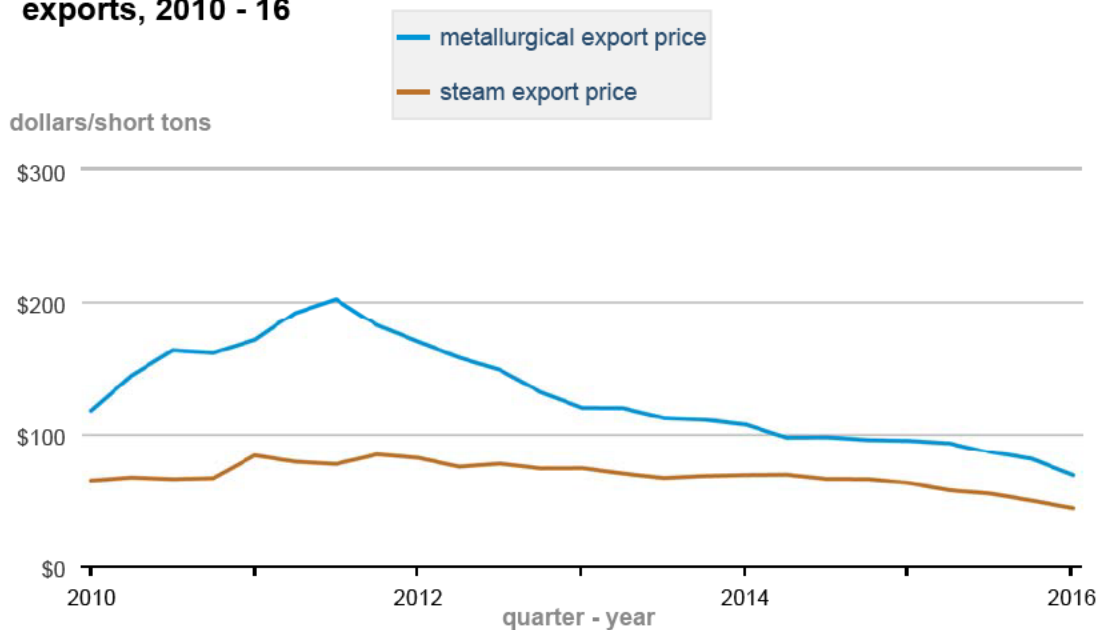
 Source: U.S. Energy Information Administration: "Quarterly Coal Report."

- Steam coal exports totaled 4.0 million short tons (31.6% lower than fourth quarter 2015); metallurgical coal exports totaled 10.2 million short tons (7.5% higher than fourth quarter 2015).

U.S. steam and metallurgical coal exports



Average price of U.S. steam and metallurgical coal exports, 2010 - 16



Source: U.S. Energy Information Administration: "Quarterly Coal Report."

Contact:

JenAlyse Arena
 Phone: 202-586-4866
 Email: Jenalyse.arena@eia.gov
 Fax: 202-287-1944

ATTACHMENT 11



Frequently Asked Questions

What is U.S. electricity generation by energy source?

In 2015, the United States generated about 4 trillion kilowatt-hours of electricity.¹ About 67% of the electricity generated was from fossil fuels (coal, natural gas, and petroleum).

Major energy sources and percent share of total U.S. electricity generation in 2015:¹

- Coal = 33%
- Natural gas = 33%
- Nuclear = 20%
- Hydropower = 6%
- Other renewables = 7%
 - Biomass = 1.6%
 - Geothermal = 0.4%
 - Solar = 0.6%
 - Wind = 4.7%
- Petroleum = 1%
- Other gases = <1%

¹ Preliminary data; based on [generation by utility-scale facilities](#).

Learn more:

[Energy Explained: Electricity in the United States](#)

[Electric Power Monthly: Chapter 1: Net Generation](#)

[Monthly Energy Review: Electricity](#)

Last updated: April 1, 2016

Other FAQs about Electricity

[Can customers choose their electricity supplier?](#)

[Does EIA have county-level energy production data?](#)

[Does EIA have data on each power plant in the United States?](#)

[Does EIA have data on the costs for electricity transmission and distribution?](#)

[Does EIA have energy consumption and price data for cities, counties, or by zip code?](#)

[Does EIA have maps or information on the location of electric power plants and transmission lines in the United States?](#)

[Does EIA have projections for energy production, consumption, and prices for individual states?](#)

[Does EIA publish data on peak or hourly electricity generation, demand, and prices?](#)

[Does EIA publish electric utility rate, tariff, and demand charge data?](#)

[Does EIA publish electricity consumption and price data by state?](#)

[How is electricity used in U.S. homes?](#)

[How many nuclear power plants are in the United States, and where are they located?](#)

[How many power plants are there in the United States?](#)

[How many smart meters are installed in the United States, and who has them?](#)

[How much coal, natural gas, or petroleum is used to generate a kilowatt-hour of electricity?](#)

[How much does it cost to build different types of power plants in the United States?](#)

[How much does it cost to generate electricity with different types of power plants?](#)

How much electricity does a nuclear power plant generate?
How much electricity does an American home use?
How much electricity is lost in transmission and distribution in the United States?
How much electricity is used for lighting in the United States?
How much energy is consumed in the world by each energy end-use sector?
How much of U.S. carbon dioxide emissions are associated with electricity generation?
How much of world energy consumption and production is from renewable energy?
What is U.S. electricity generation by energy source?
What is the difference between electricity generation capacity and electricity generation?
What is the efficiency of different types of power plants?
What is the outlook for home heating fuel prices this winter?
What types and amounts of energy are produced in each state?

ATTACHMENT 12

Powder River Basin Coal: Powering America

Timothy J. Considine

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ABSTRACT

Powder River Basin (PRB) coal in Wyoming and Montana is used to produce 18 percent of the electricity consumed in the United States. Coal production from the PRB more than doubled between 1994 and 2009. PRB coal companies produced greater amounts of coal at declining real prices over much of this period through investment in equipment and production systems that achieved massive economies of scale. The bulk of PRB coal is shipped to the middle part of America from Texas in the south to Michigan in the north and New York in the east. States that consume significant amounts of PRB coal have electricity rates well below the national average. The largest industrial users of electricity are in these regions. Replacing PRB coal would require almost 5.5 trillion cubic feet of natural gas per year, representing a 26 percent increase in demand. Such an increase in gas consumption would increase prices for natural gas by roughly 76 percent. In such a world, U.S. energy users would pay \$107 billion more each year for electricity and natural gas. Hence, by using PRB coal, the U.S. economy avoids \$107 billion per year in higher energy costs. Estimates reported in the literature indicate that the gross environmental damages from PRB coal production are \$27 billion. Hence, the net social benefits of PRB coal are \$80 billion per year. Given the large size and low cost of these reserves, PRB coal will likely supply societal energy needs well into the future as long as the public and their elected officials are willing to accept the environmental impacts in return for the substantial economic benefits from using PRB coal.

Keywords: Coal; Scale Economies; Natural Gas; Electricity; Environment

1. Introduction

Energy is a key factor in economic development, transforming agrarian societies to modern industrial ones. This societal transformation driven by the accumulation of income and wealth eliminates many contagious diseases, reduces child mortality, and lengthens adult life expectancy. This virtuous cycle has been demonstrated over the past two centuries in dozens of countries around the world. The emergence from poverty begins as countries develop transportation systems using petroleum and electricity networks, often based upon coal. These technologies are capable of achieving massive economies of scale that provide large amounts of energy at low cost. These abundant and reliable supplies of energy spur technological change, productivity gains and ultimately economic growth, improving the living standards of millions of people. Ayers and Warr [1] recognize the critical importance of energy in economic growth, observing that energy enables technology to utilize capital and labor

resources.

It is no coincidence that the world energy complex is built upon fossil fuels. Consumers prefer low-cost, reliable energy and producers who provide these services prosper. Based upon data reported by British Petroleum [2], during 2012, the world economy derived 87.3% of its total energy from coal, oil, and natural gas, which was up from 86.8% in 2002. The share of coal in world energy consumption actually increased from 25.1% in 2002 to 26.3% in 2012. These fuels have empowered modern industrial societies to raise living standards for billions of people. Of the 12.7% of carbon-free energy used worldwide during 2012, 6.0% is nuclear, 6.0% is hydroelectric power, and the remaining 0.7% is renewable energy.

One of the largest low-cost sources of energy on the planet is the Powder River Basin (PRB) coal reserve in Wyoming and Montana. Unlike Eastern U.S. coal deposits that average a few feet in thickness, PRB coal seams are as tall as eight-story office buildings. Coupled with

advanced mining technology and efficient transportation systems, these enormous coal seams enable incredible economies of scale and low production costs as described by Gerking and Hamilton [3]. In addition, PRB coal has very low sulfur content, allowing some electricity producers to use it directly without installing and operating expensive pollution control equipment [4].

The expanded use of PRB coal has generated important economic and environmental benefits for the United States. The rising market share of PRB coal was one of the key factors contributing to falling real electricity prices during much of the 1980s and 1990s. Lower electricity costs encourage the adoption of advanced electricity-using technologies that reduce the direct use of fossil fuels and increase end-use energy efficiency in a wide range of applications. These technologies augment productivity growth, which is the key driver for higher per capita income and wealth.

The goal of this paper is to estimate the importance of PRB coal to the U.S. economy. The paper is organized as follows. Section two provides an overview of energy and economic development. Along this, continuum is another important linkage between energy and productivity growth, which is the focus of section three. The fourth section provides an overview of the rise of PRB coal. The driving forces encouraging its use are identified and discussed in the fifth section. The role of PRB coal in providing low-cost and clean electricity to more than 30 states is then examined in section six. To appreciate how important a cog PRB coal is to the U.S. electricity sector, the impacts on electricity rates of replacing Wyoming PRB coal with natural gas are estimated in section seven. The results reveal that electricity rates would increase substantially. While such a switch is unlikely for a variety of economic and political reasons, this exercise illustrates the opportunity cost of not using PRB coal and, hence, its value to the U.S. economy. These benefits are then compared with the social costs arising from the environmental damages from coal-fired electricity production. The paper then discusses the challenges and opportunities for the utilization of PRB coal before the concluding section.

2. Energy and Economic Development

Energy plays an important role in economic development. The discovery of large fossil fuel reserves and the development of technology to deliver energy from these resources literally provide the fuel for an economic growth engine in which declining costs for energy contribute to lower prices for goods and services and an increase in demand for this lower priced output, which then drives costs down further due to economies of scale and learning effects [1]. The United States during the late 19th and early 20th century provides a classic example of this

growth engine. China is in a similar situation today providing an example of how coal can be used to pull people out of poverty and lift an entire society to higher living standards. India and many other countries around the world are learning from China's example.

Energy provides basic services for human existence, such as light for reading and fuel for cooking. Barnes and Floor [5] describe a continuum of different fuels used through various stages of economic development, known as the "energy ladder." For subsistence cultures, energy tends to come from harvested or scavenged biological resources, such a wood and dung. During the intermediate stage, processed biofuels, such as charcoal, animal power and some commercial fossil fuels are consumed. Liquid fuels, natural gas, and electricity are widely used during the last stage of industrialization.

These stages entail different resource requirements with labor intensity falling and capital intensity rising as the economy advances. For example, households relying upon wood for cooking devote considerable amounts of labor to collect firewood. During the intermediate stages, some capital outlays are required for kerosene lamps or coal-fired cook stoves [5]. Much more capital is required during the final stage of development to build electricity and natural gas supply networks.

Expanded energy availability leads to a disproportionate increase in productivity and economic growth. The first source of these gains arises from the expanded use of commercial energy by households. Consider the shift from kerosene to electric lighting. As the price of light declines, more illumination services are consumed, which leads to a direct increase in economic welfare. For example, people can read and learn during the evening hours. There is a second round effect stemming from the productivity enhancements that light provides. Households can divert hours once spent gathering firewood to working in the market economy, which generates income for the household and labor services for the economy [5]. In addition, with inexpensive illumination household members can devote time at night to improving literacy and education capacity. These productivity enhancements lead to an additional increase in the demand for lighting that contributes even more economic welfare for society.

Besides raising households from the depths of poverty, increased energy availability contributes to the construction of infrastructure and buildings and the manufacturing of durable producer equipment. These durable assets are made from materials, such as steel, aluminum, copper, concrete, and glass. Producing these materials requires significant amounts of energy [6]. Utilizing abundant energy supplies helps lower the cost of materials, structures and equipment, which facilitate the accumulation of capital assets.

All economies advancing into the industrialization stage

go through this phase of infrastructure development. For example, during the period from 1880 to 1920 the United States experienced material intensive economic development so that energy intensity, or the ratio of energy consumption to gross domestic product, was rising. China is at a similar stage in recent years. For analysis of how materials affect economic development see Considine [7] and Van Den Bergh and Janssen [8].

Greater energy availability also may enhance the productivity of energy infrastructure investments, leading to lower transportation costs and expanding the geographic size, scale, and efficiency of markets. Efficient electricity networks also generate positive economic externalities by lowering the costs of telecommunications and information, which in turn generate additional productivity enhancements.

Case studies done by the Office of Technology Assessment (OTA) [9,10] provide definitive evidence of how energy service availability spurs economic growth. In addition, the World Development Report by the World Bank [11] discusses the importance of infrastructure provision to economic development. The OTA studies [9,10] identify how much labor time is invested in subsistence energy provision and how much inefficient manual labor is used for activities that could be accomplished with simple machines powered by external energy sources.

On the business side of the economy, greater supplies of energy and lower costs for energy services foster:

- Economies of scale from larger scale energy provision, such as petroleum refineries and electric power generation,
- Lower transportation costs and more competitive manufacturing, and
- The development of communication networks that generate productivity enhancements across broad swaths of the economy

Therefore, household and business sector impacts contribute to an overall increase in the quality of life, including better health, less drudgery, more leisure, greater communication, and increased social status.

All of these factors contribute to a strong positive correlation between economic output and energy use, which also generates greenhouse gas emissions. The growth in greenhouse gas emissions, however, has been less than the rate of growth in gross domestic product (GDP) due to energy efficiency gains, energy conservation, and switching to less carbon intensive fuels. For example, during the 1950s real U.S. GDP grew at a 4% annual rate while CO₂ emissions from energy rose 2.4%. From 1960 to 1973, the growth rates were 4.1% and 3.7% respectively. CO₂ emissions increased only 0.7% from 1974 to 1986 while GDP growth also slowed to 2.8%. During the next two decades from 1988 to 2011, real GDP rose 2.5% per annum while CO₂ emissions grew 0.6% per

year. In 1950, the carbon intensity of GDP was 1.34 million metric tons of carbon dioxide per billion dollars of GDP. By 2011, the carbon intensity of GDP was 0.41 million metric tons per billion dollars of GDP. So as the economy grows, carbon intensity, defined as CO₂ per dollar of GDP, falls [12].

These improvements in carbon intensity arise largely from productivity growth that ultimately comes from higher levels of investment, spurred by expectations of higher sales from greater economic growth. There are many sources of productivity growth—education, training, technological innovations, and notably reliable and low-cost supplies of energy. A closer look at the energy connection now follows.

3. Energy and Productivity Growth

Schurr [13] maintains that the increased use of more flexible energy forms, liquid fuels and especially electricity enhanced “the discovery, development, and use of new processes, new equipment, new systems of production, and new industrial locations.” The effect was powerful enough in terms of raising labor and capital productivity that the energy intensity of output fell. In other words, changes in the quality of energy services drive broader economic productivity, apart from the physical availability of energy.

Economists have long sought to accurately measure and identify the key drivers for productivity growth. Multifactor productivity is defined as total output divided by all factor inputs. Output growth in excess of the growth of inputs is known as the rate of technical progress. Economists have used a variety of advanced econometric methods to identify the separate contributions of input growth and technical change in multifactor productivity growth. Studies by Jorgenson [14,15] disaggregate technical change into several components, including that portion of productivity growth associated with the use of electricity. Jorgenson finds that for 23 of 35 sectors of the economy, technical progress tended to be electricity using, which emphasizes the connection between electrification and broader economic progress. In addition, 28 sectors had technical progress that were non-electric energy using. So the relationship between technical change and energy use is pervasive. Jorgenson’s studies clearly demonstrate that technical progress is associated with energy use. Overall, Jorgenson finds that for 32 of the 35 sectors of the economy, energy-using technical change occurred. By symmetry, this finding suggests that higher energy prices act as a drag on productivity growth.

Another important dimension is energy reliability, especially for electricity. The costs of electricity supply interruptions per lost megawatt hour are several orders of magnitude larger than the cost of base load or peak electricity supply costs [10]. These costs arise from the need

to maintain backup generators that could have been more productively employed under greater system reliability.

While the growing use of microcomputers and the Internet gets a good share of the credit for the impressive productivity growth in the U.S. economy since the late 1980s, based upon the findings of Schurr [13] and Jorgenson [14,15], falling real electricity prices at least should be considered as a contributing factor. One of the key factors contributing to the fall in the real price of electricity during the 1980s and 1990s was the development of Powder River Basin coal. This is an important lesson of how advances in a basic industry can have broad ramifications for our entire economy. A closer look at the Powder River Basin now follows.

4. The Emergence of Powder River Basin Coal

Great energy reserves have played an important role in economic development and national strategy. The giant oil field in East Texas that went into production during the Great Depression allowed America to power the Allied war effort during World War II. The super-giant oil fields of the Middle East developed during the 1950s fueled the Marshall Plan for rebuilding Western Europe and Japan after the war. Together these fields contributed to strong, non-inflationary economic growth from 1948 to 1972 by supplying large amounts of energy at low and stable prices.

Similar to the aftermath of the oil price shocks during the 1970s and 1980s, the world has emerged from a deep recession after record high oil and natural gas prices during 2008. Unlike the cartel actions that contributed to earlier price shocks, energy supply constraints were the principal culprit for the 2008 oil and natural gas price spike. As the world renews its search for new energy reserves, Powder River Basin coal may play an important role.

The Powder River Basin (PRB) in eastern Wyoming and Montana contains one of the largest and lowest-cost sources of energy on the planet. According to a recent assessment by Luppens *et al.* [16], the PRB has over 200 billion short tons of coal in place, which is equivalent to over 3616 quadrillion British Thermal Units (quads) (see **Table 1**). According to Luppens *et al.* [16] technically recoverable reserves are 77 billion tons but these reserves increase considerably with higher market prices for coal. Boyd [17] estimates 620 billion tons of PRB coal in place.

Using the 200 billion ton reserve estimate for PRB coal as a basis for comparison, the next largest energy reserve, the North Dome-South Pars natural gas field in the Middle East, is a distant second at 1228 quads. Ghawar, the world's largest oil field in Saudi Arabia has 418 quads in reserve.

Table 1. Comparative Size of Powder River Basin Coal Reserves.

Field	Resource	Quadrillion BTU
Powder River Basin (Wyoming & Montana)	Coal	3616
North Dome - South Pars, Qatar-Iran	Natural Gas	1228
Ghawar, Saudi Arabia	Oil	418
Burgan, Kuwait • in decline	Oil	365
Urengoy, West Siberia, Russia	Natural Gas	275
Next 22 Largest Oil Fields	Oil	1934
Next 20 largest Natural Gas fields	Natural Gas	1997

At current production rates of roughly 400 million tons per year, Powder River Basin technically recoverable reserves would support over 192 years of continuous coal production. Even if production doubled, there would be enough reserves to last over 95 years. As mining technology and extraction strategies continue to advance, additional PRB reserves could be produced that would extend the production horizon to the distant future.

The Powder River Basin is in northeast Wyoming and southeast Montana, measuring approximately 120 miles from east to west and about 200 miles from north to south. Most of the coal being mined there now comes from a relatively narrow string of mines located in the green shaded area in **Figure 1**.

The coal deposits formed about 60 million years ago when the land began uplifting from a shallow sea. During that time, the local climate was subtropical with about 120 inches of annual rainfall. Organic material collected into peat bogs on the basin floor for over 25 million years. Sediments from mountain runoff buried the peat, compressed it, and converted it into coal. Over the last several million years, the overlying sediment eroded, leaving the coal seams relatively near the surface.

The Powder River Basin coal producing area includes two counties in Wyoming, Campbell and Converse, and two in Montana, Big Horn and Rosebud. Campbell County with Gillette as the center is by far the largest producing area within the PRB.

The first coal mine in the Powder River Basin dates back to the 1920s, but large-scale open cut mining did not begin until the 1970s. By 1994, the PRB was producing more than 250 million tons, which was 25% of total U.S. coal production (see **Figure 2**). After growing at a 4.8% annual rate from 1994 to 2008, total PRB coal production reached almost 496 million tons in 2008, constituting 42.3% of U.S. coal production. Non-PRB coal production increased only 0.8% per annum over the same period. Since 2008, PRB coal production has declined 6.7 percent due to fuel switching in the electric utility sector from coal to natural gas and from the closure of coal-fired coal plants as they reached the end of their useful life or faced higher costs arising from envi-

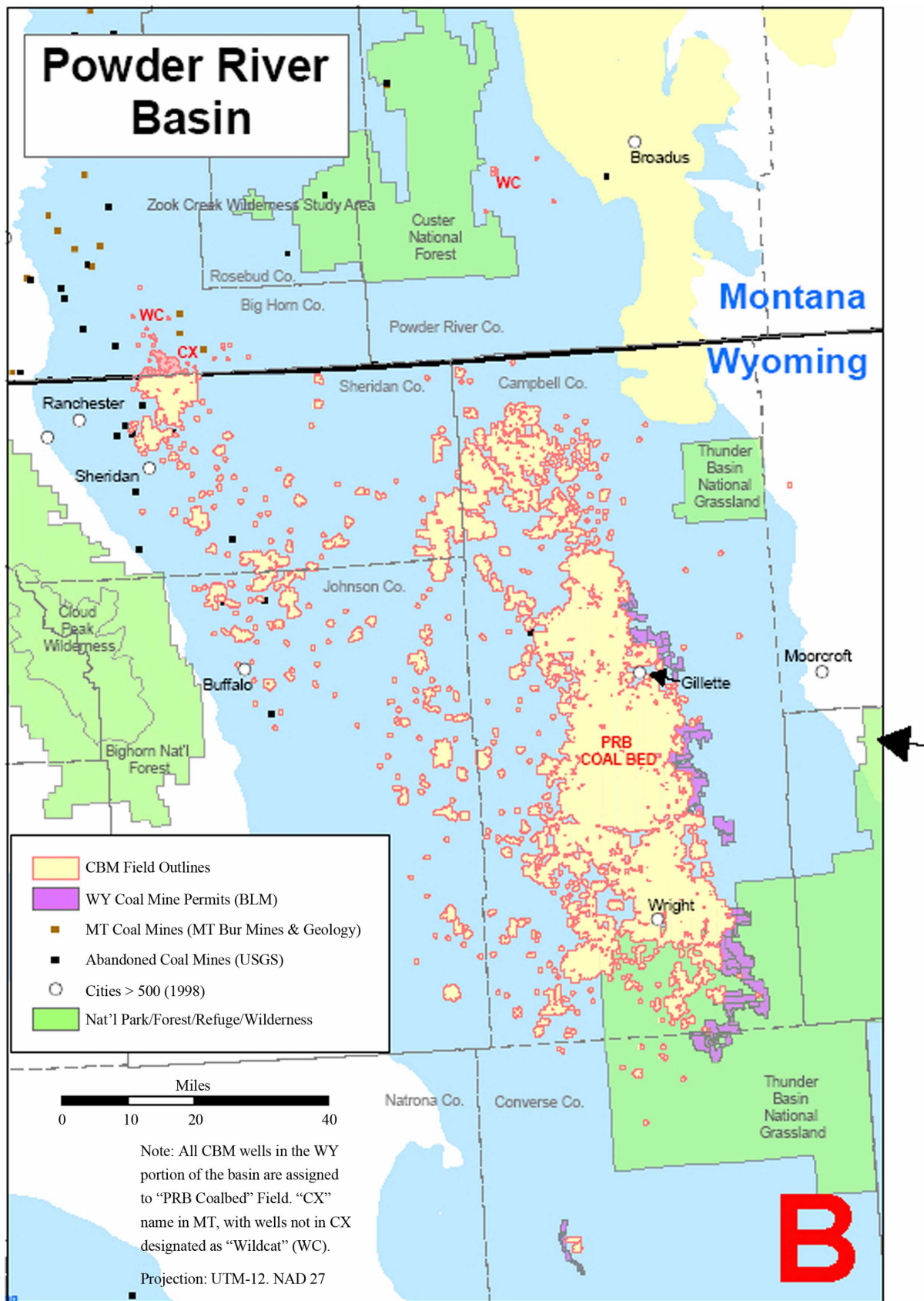


Figure 1. Map of the Powder River Basin Coal Field [18].

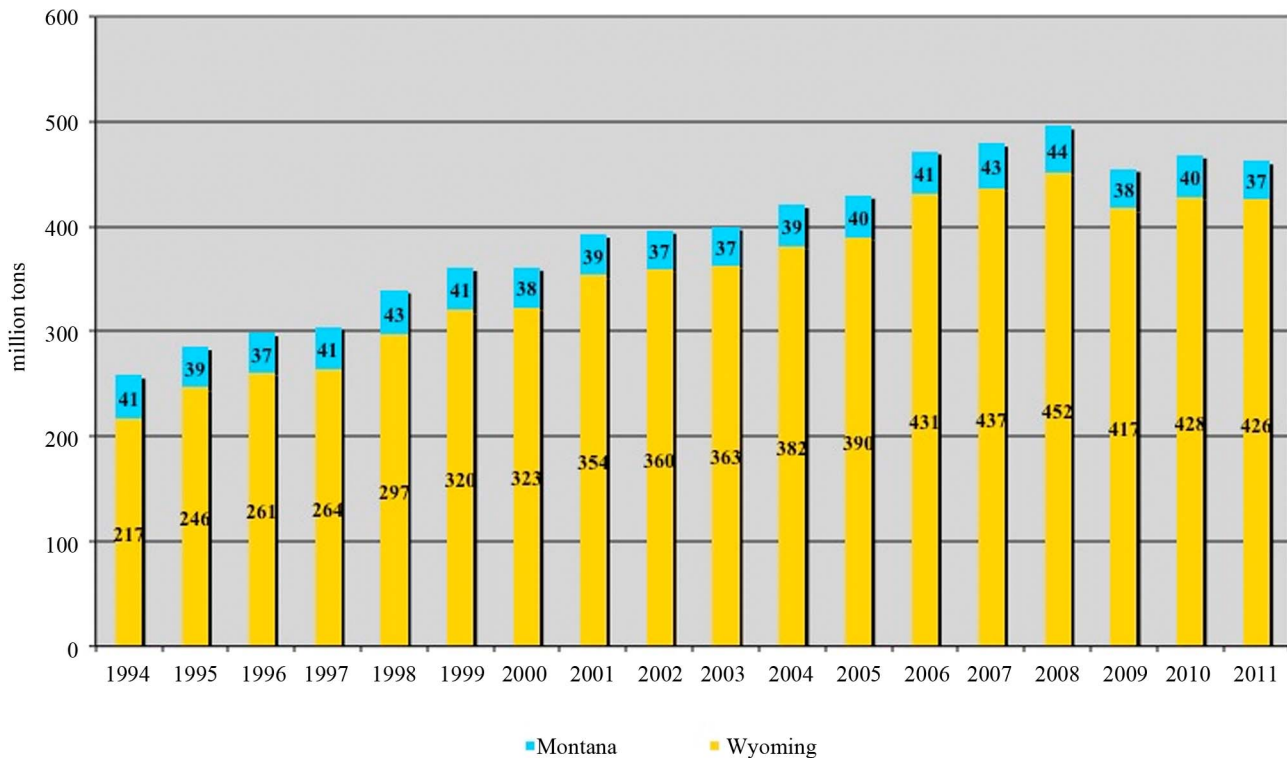


Figure 2. Coal Production from PRB, 1994-2011 [19].

ronmental regulations.

As **Figure 2** indicates, most PRB coal comes from Wyoming, where PRB coal production went from 216 million tons in 1994 to 452 million tons in 2008 and then to 426 million tons in 2011. In contrast, PRB coal production from Montana increased from 41 to 44 million tons between 1994 and 2008 and then declined to 37 million tons in 2011.

5. The Competitiveness of PRB Coal

The dramatic increase in PRB coal production is driven by the fundamental economics of coal production, transportation, and utilization. Most coal consumers in the U.S. are producers of electricity. These firms generally try to minimize their fuel costs. Most of these producers are regulated utilities. As a result, these companies must justify their fuel choices before Public Utility Commissions who are interested in keeping electricity rates at just and prudent levels. The unique geology of the PRB coalfields combined with the application of advanced mining technology enables PRB coal producers to satisfy their customer's needs to minimize fuel acquisition costs.

Other key players enhancing the competitiveness of PRB coal are the railroads. Roughly half of the delivered cost of coal to electricity producers is transportation [3]. Deregulation and investments in rail improvement and access played a key role in reducing transportation costs for delivering PRB coal.

Finally, another key factor involves environmental regulations, see [20,21]. The Clean Air Act Amendments of 1990 mandated significant reductions in emissions of sulfur dioxide from energy consuming facilities, such as electric power plants. Electricity providers have a number of options to achieve emission control standards, including the substitution of low-sulfur PRB coal for higher sulfur fuels, such as Eastern coal and residual fuel oil [21].

A key source of PRB coal's competitiveness is the high productivity of the mining operations in the region. **Figure 3** below plots labor productivity of coal producers in Wyoming, in the Powder River Basin, and outside the region. Labor productivity among PRB producers is on average nine times greater than other U.S. coal producers. PRB mines averaged 40 tons of coal mined per employee per hour while other producers averaged 4.4 tons per employee per hour. To a certain extent, this huge difference in productivity reflects the relatively larger coal seams in the PRB. Other factors, however, are at work.

Rather than differences in absolute levels of productivity these factors are manifested in the trends in productivity over time. To measure these trends, a comparison between Wyoming and other U.S. producers is required because PRB productivity statistics are unavailable prior to 2000. The average annual growth in labor productivity in Wyoming between 1985 and 2007 was 3.9% per annum, while the same measure in other re-

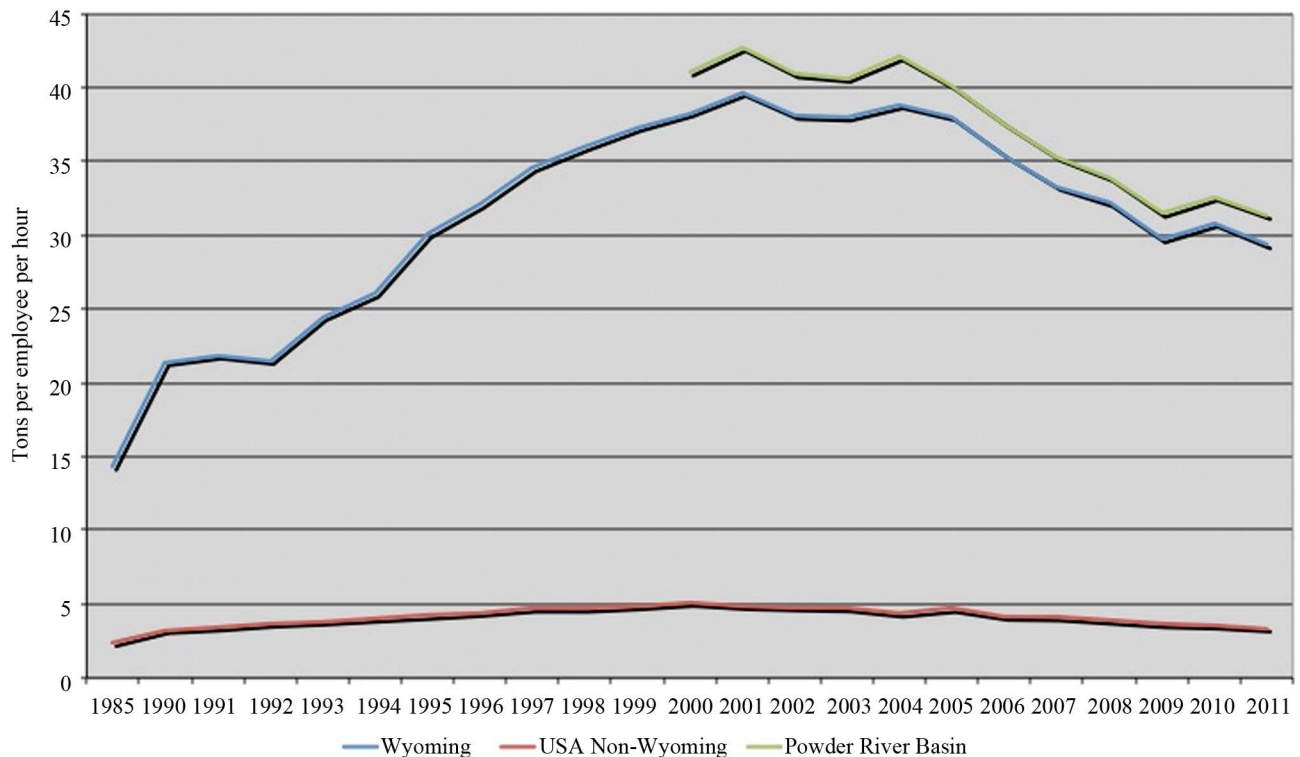


Figure 3. Labor Productivity of Various Coal Producers, 1985-2011 [22].

gions was 1.9% per year. Although both productivity growth rates are impressive, the higher growth rate in Wyoming may reflect differences in labor incentive structures, workplace rules, and technology adoption.

Another key factor contributing to PRB coal competitiveness has been lower transportation rates. In 1980, the U.S. Congress passed the Staggers Rail Act that deregulated the railroad industry. Prior to the Act's passage, rail rates were linked to tariffs regulated by the Interstate Commerce Commission. After the passage, railroads could charge their own tariffs and began to compete with each other for business by setting competitive rates. After the early to mid-1980s average rates for coal transportation declined steadily. In **Figure 4** below regional coal transportation rates are reported from 1979 to 2010 for coal shipped from Appalachia, Illinois, and the Powder River Basin. Coal transportation rates for PRB coal declined 45% from 1979 to 2010 while rates increased 30% and 54% respectively for coal shipped from Appalachia and Illinois (see **Figure 4**).

Higher productivity and lower transportation costs contributed to a trend of declining real prices for coal in the U.S. from the late 1970s through the first few years of this century. Prices for bituminous and sub-bituminous coal are plotted in **Figure 5** from 1979 to 2011. PRB coal is sub-bituminous so prices for this grade reflects trends in PRB coal prices. The first notable feature of this time series plot is the wide differential between prices for bi-

tuminous and sub-bituminous coal. These price differentials are consistent with a competitive market in which prices reflect productivity and cost differences between regions. Early in the sample, sub-bituminous coal prices were about 40% of prices for bituminous grades. Towards the end of the period, prices for sub-bituminous grades were only 27% of bituminous prices. These trends are also consistent with the productivity trends discussed above in which the PRB region became relatively more productive over time.

These differences in prices between coal grades affected the relative composition of shipments over time. As **Figure 6** illustrates, bituminous coal shipments were substantially higher than sub-bituminous coal shipments until 2001. By 2006, sub-bituminous shipments were just 4 tons less than bituminous coal deliveries and by 2010 they exceeded bituminous shipments. These adjustments in part reflect fuel use decisions by electricity producers in response to delivered cost and environmental regulations.

Sub-bituminous coal has substantially lower sulfur content with about 0.4% sulfur by weight as opposed to 1.5% for bituminous coals. The rising share of PRB coal played an important role in reducing U.S. emissions of sulfur dioxide from 1995 to 2010. From their peak of 13.5 thousand tons in 1997, sulfur dioxide emissions dropped to 5.4 thousand tons in 2010 (see **Figure 7**). Emissions per unit of electricity generated from fossil

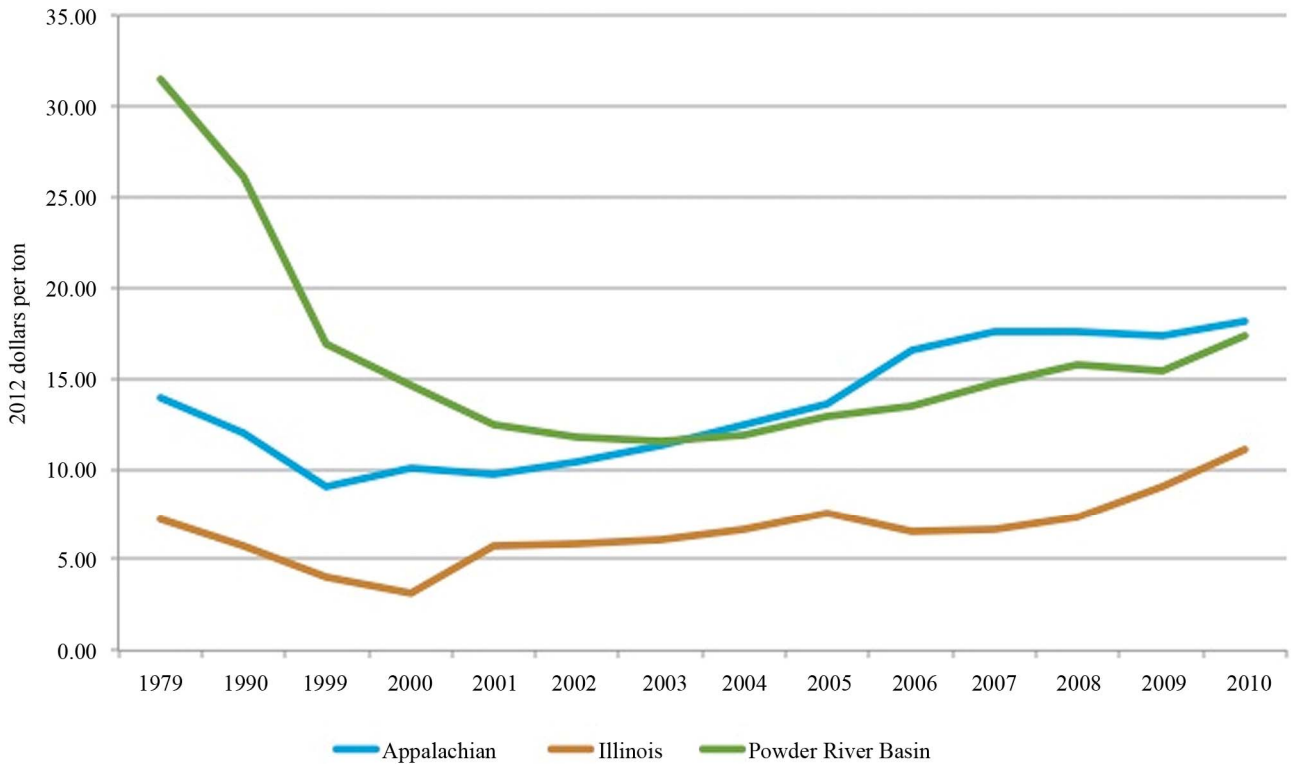


Figure 4. Coal Transportation Rates by Region, 1979-2010 [23].

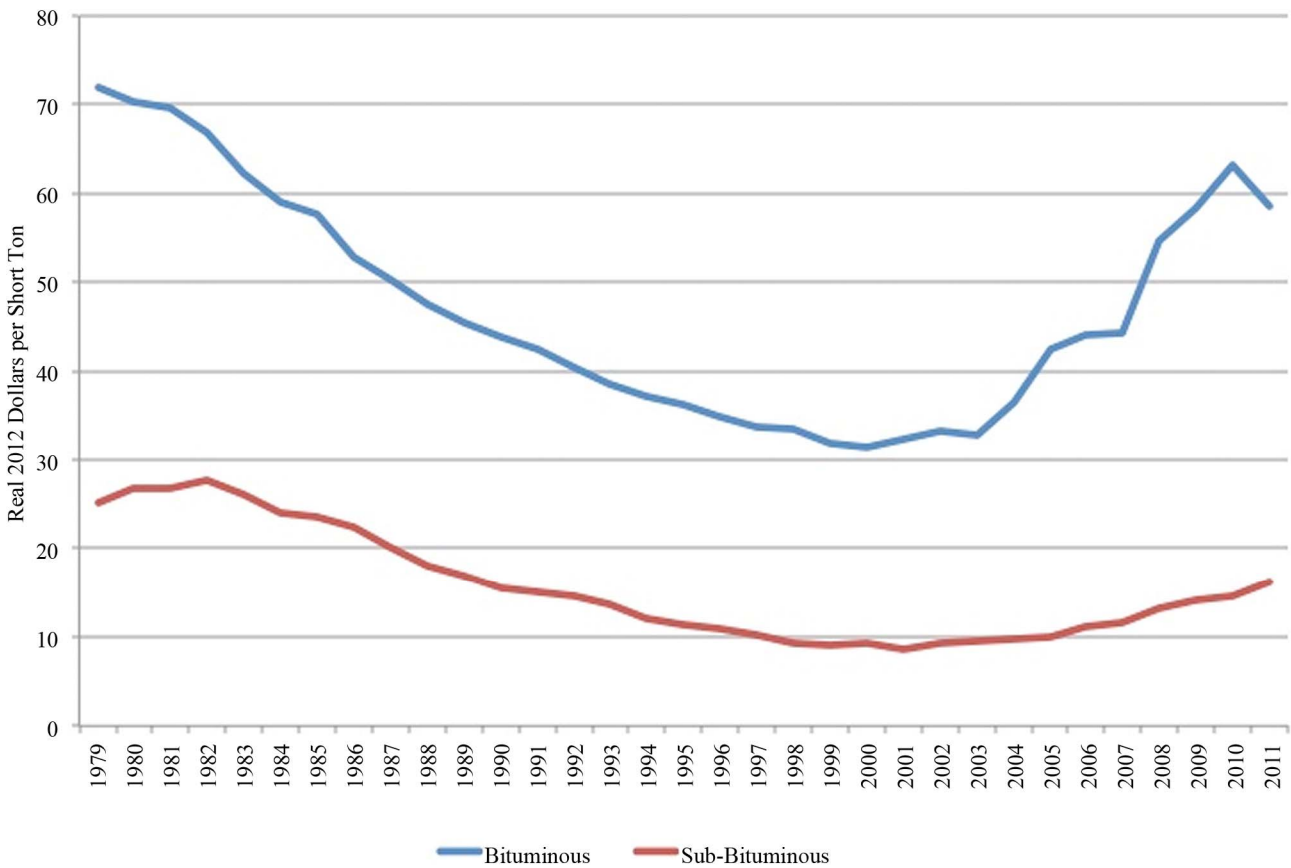


Figure 5. Real Prices for Coal by Grade, 1979-2011 [24].

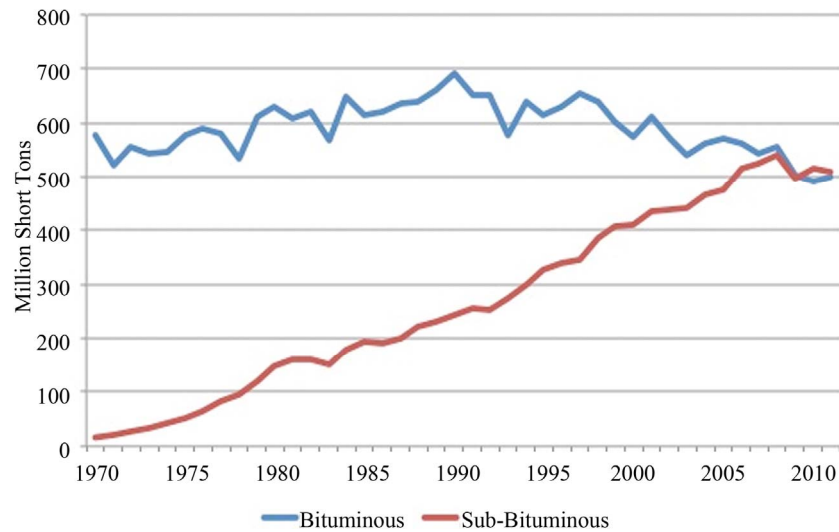


Figure 6. Coal Shipments by Grade, 1969-2011 [25].

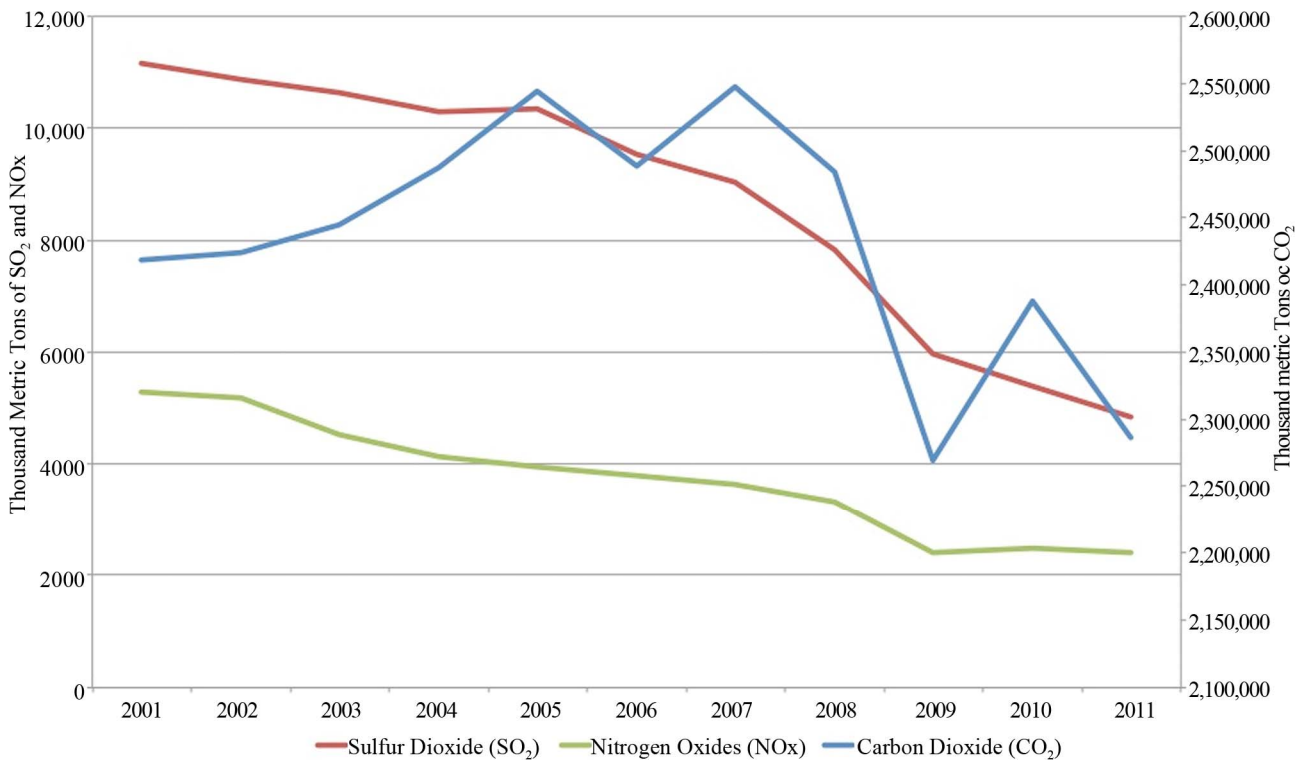


Figure 7. Sulfur Dioxide and Nitrogen Oxide Emissions from Power Plants, 1995-2010 [26].

fuels also declined, which reflects in part switching to PRB coal and natural gas [21].

6. PRB Coal and Electricity Prices

The low cost and high quality of PRB coal have been the primary drivers for its increasing use and market share. This expanded consumption of PRB coal has broad geographical scope. Most of the growth in PRB coal consumption has been in the Midwestern, Southern and

Western United States. As **Figure 8** below indicates, about 18% of coal consumed in the East, which includes New England, Mid-Atlantic, and North Central states, came from the PRB in 1992 but by 2008 that percentage increased to 60% of that market.

During 2011, 33 states used PRB coal, which is down from 38 states in 2008. The largest market for PRB coal is Texas, which consumed over 62 million tons during 2011. The next largest market is Illinois at 61 million tons. Missouri is third at 44 million tons. Of the 20 states

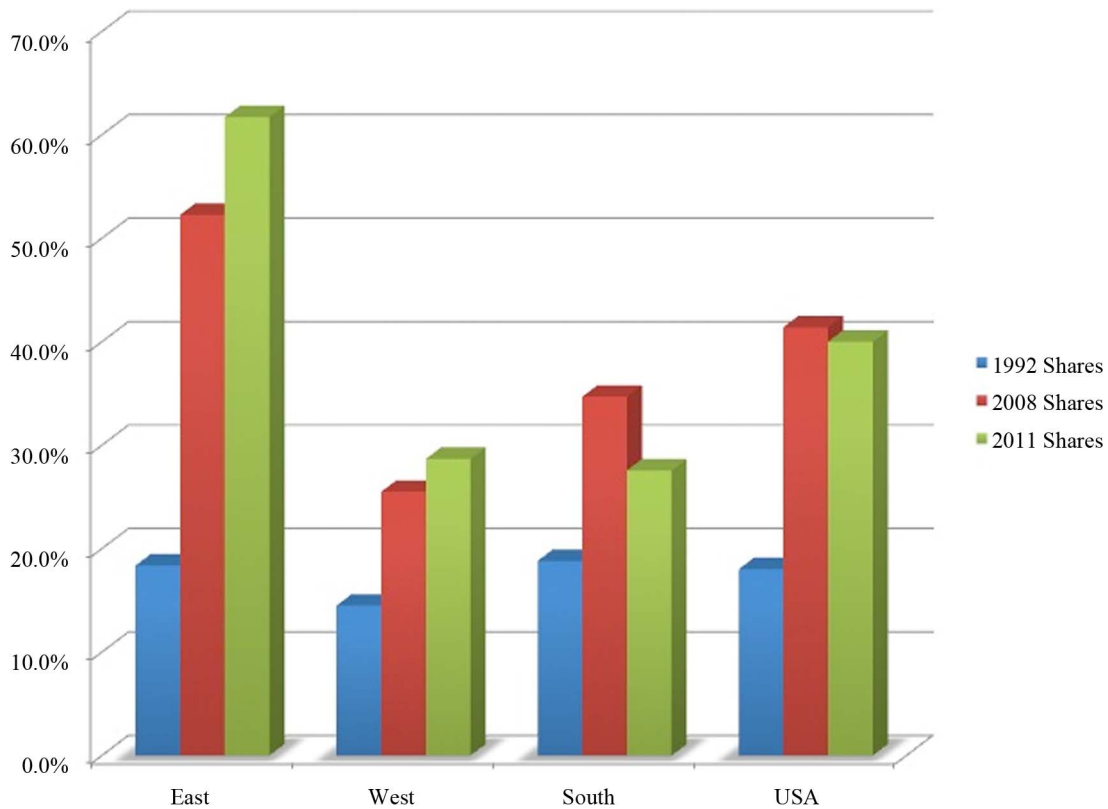


Figure 8. Growth in market share of PRB coal, 1992, 2008, and 2011 [27,28].

that consume more than 5 million tons of PRB coal, all but two have retail electricity prices below the national average of 9.9 cents per kilowatt-hour. These 20 states on average have retail electricity rates that are 12.4% below the national average (see **Figure 9**).

Of the 15 states that use no PRB coal, 10 have retail electricity rates above the national average (see **Figure 10**). The exceptions include Idaho, which uses large amounts of hydroelectric power, and New Mexico, Virginia, and Utah, which use local coal, and South Carolina, which has significant nuclear energy assets. Average retail electricity rates are 34% above the national average for states that do not use PRB coal and 62% above the national average for this group without Idaho, New Mexico, South Carolina, North Carolina, Montana, and Virginia. These findings suggest that regions that do not use PRB coal are likely to have higher than average electricity rates.

The expanded use of PRB coal over time is also an important factor explaining electricity price trends. After reaching a peak of 11 cents per kilowatt-hour in 1983, real electricity prices declined steadily during the 1980s and 1990s, reaching a low of 7.6 cents per kilowatt-hour in 1999. During the same period, the share of all electricity generated from Wyoming coal, which is primarily from the PRB, rose from 8 to 15 percent. The increased market share of PRB coal directly contributed to lower

real electricity prices during the 1980s and 1990s (see **Figure 11**). Hence, the PRB coal industry is a good example of how dramatic improvements in productivity of a basic industry like coal production translates into downstream benefits, such as reductions in the real electricity prices. Following the supply chain, these lower real electricity prices improve the competitiveness of electricity-using sectors. After 1999, while the share of PRB generated electricity continued to rise until 2008, real electricity prices increased, primarily due to rising natural gas prices. Since 2008, the share of PRB coal has declined yet real electricity prices fell, in this case, due to an abundance of low cost shale gas that drove market prices for natural gas well below their peak in 2008.

Once again PRB coal plays a pivotal role. As we have seen above, the consumption of high quality, low-cost PRB coal contributes to lower prices of electricity observed in the industrial heartland of the United States. **Figure 12** vividly illustrates that most industrial consumption of electricity occurs in the central and southern regions of the United States where industrial electricity rates are lowest. The West Coast and northeastern sections of the United States have the highest industrial electricity rates and substantially lower industrial electricity consumption. Historically, electricity intensive industries, such as metals and equipment manufacturers, gravitate to areas with relatively low electricity rates.

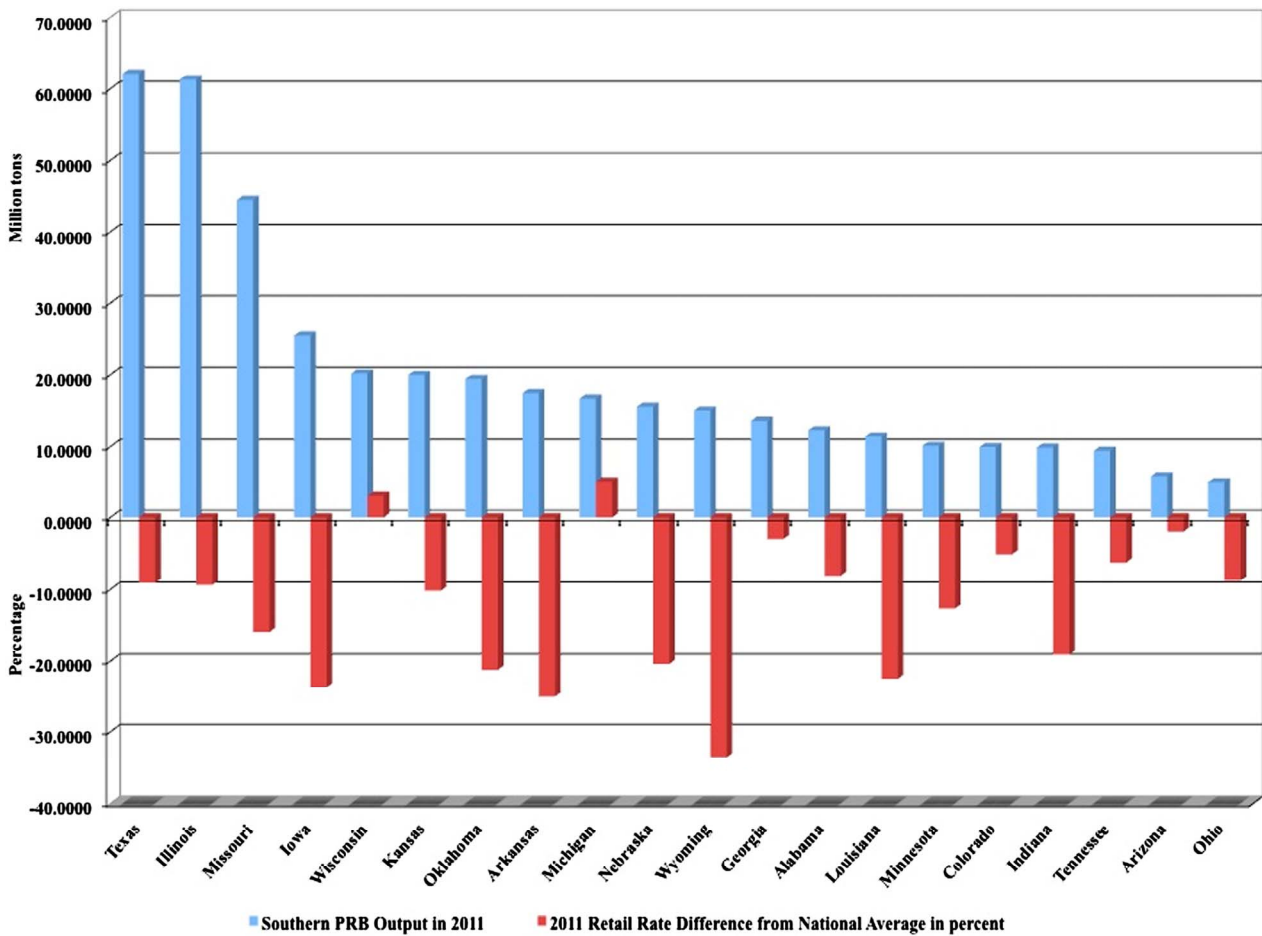


Figure 9. PRB Coal Users and Electricity Rate Differences from National Average in 2011 [28,29].

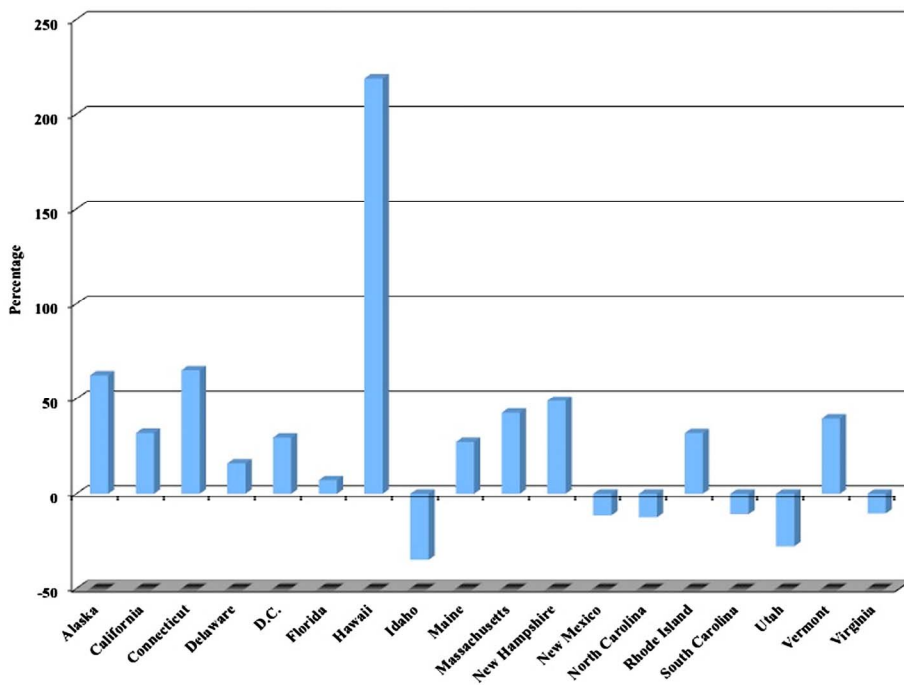


Figure 10. Retail Electricity Rate Differences for non-PRB Coal Users in 2011 [28,29].

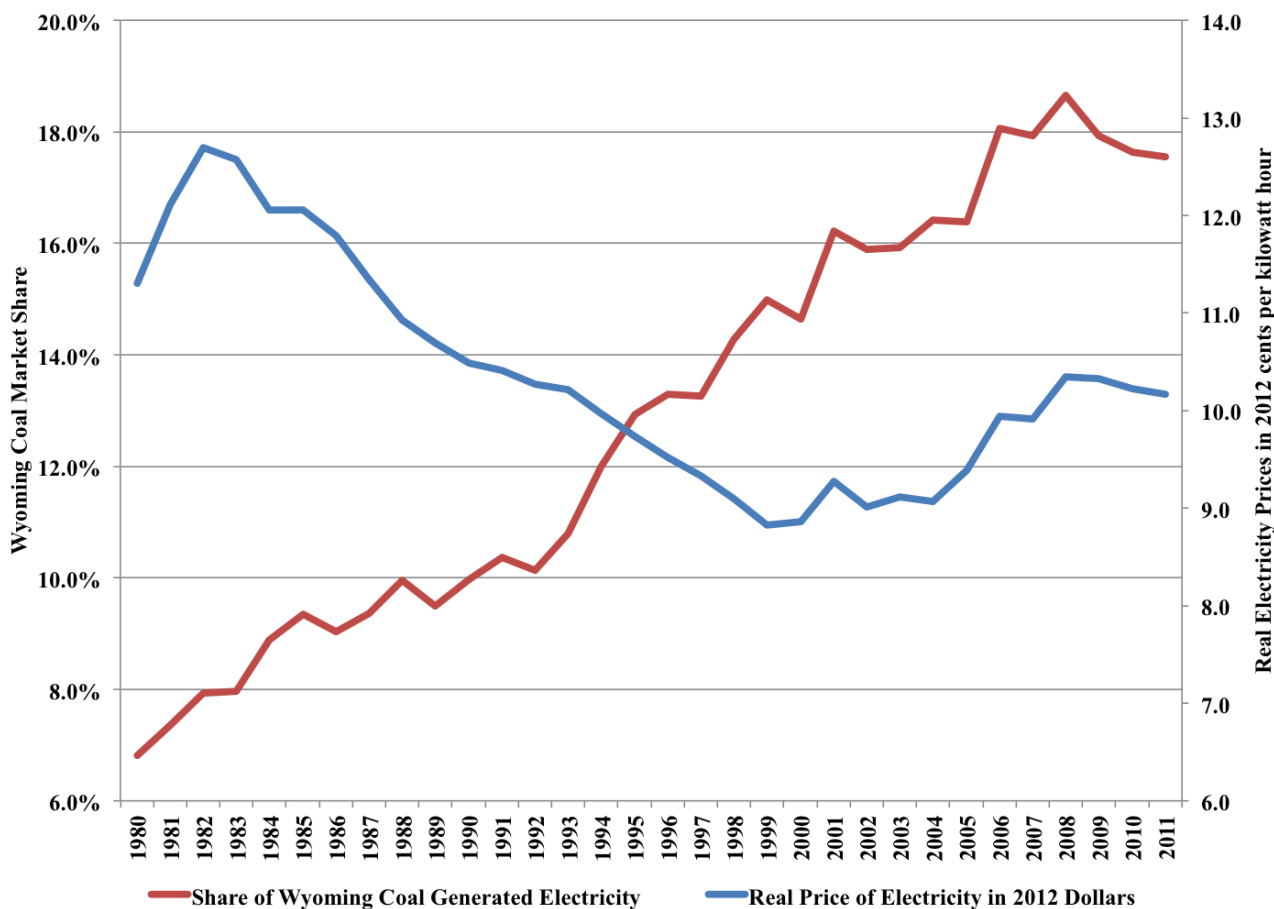


Figure 11. Share of Wyoming Coal Generated Electricity and Real Prices, 1980-2011 [28,29].

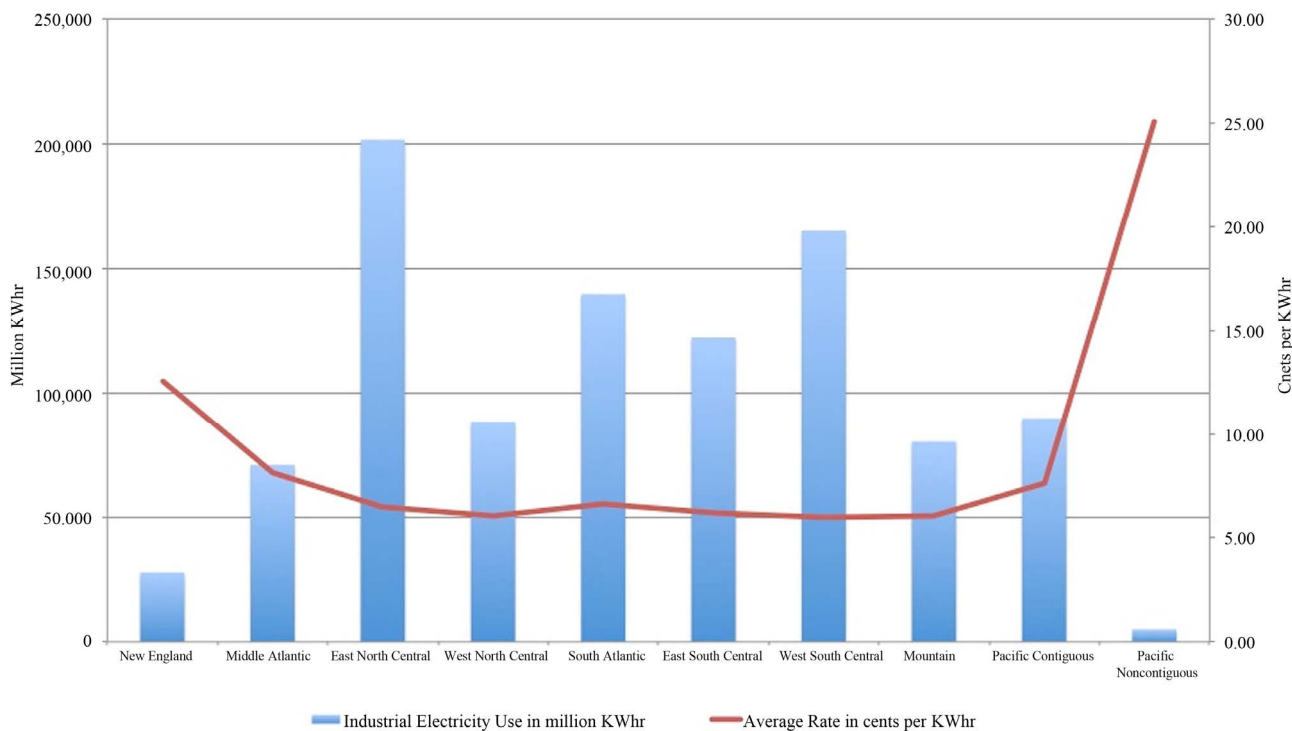


Figure 12. Industrial electricity consumption and rates by region in the U.S. in 2011 [30,31].

As the pace of PRB market penetration slowed and the use of natural gas in power generation increased, real electricity prices in the U.S. stopped falling and began rising significantly. Prices for natural gas paid by electricity producers increased from \$3 per thousand cubic feet in the year 2000 to almost \$10 per thousand cubic feet in 2008 (see **Figure 13**). From 1998 to 2008, the average annual increase in real natural gas prices was 12%. Real electricity prices during this period increased 1%. This increase in real electricity prices would have been larger without the cost cushioning impact of PRB coal. From 2009 through July of 2013, the average annual rate of decline in real natural gas prices was 10.8%. As a result, real electricity prices declined 1.3% during this period. So clearly, since the mid-1990s natural gas prices affect electricity prices.

As **Figure 14** illustrates, petroleum prices are far more volatile than coal prices. The chart below reports the mean and standard deviations (denoted as S.D. in **Figure 14**) in prices paid by electricity producers for coal, petroleum, and natural gas. Based upon the standard deviation, natural gas prices are nearly seven-times more volatile than coal prices. As we increase our reliance on natural gas in power generation, the cushioning effect that low-cost PRB coal has on average fuel costs diminishes and average electricity rates become more sensitive to changes in natural gas prices. For regions like the Northeast and Pacific coast, this transition will further increase average electricity rates, which are already well above the national average. But for the industrial heartland, increasing the use of natural gas in electricity generation could dramatically increase electricity rates.

Many analysts have argued that the U.S. economy is entering an era of abundant natural gas. Indeed, recent price trends tend to support that view. A look at the long-term relationships between coal, petroleum, and natural gas prices illustrates the highly unusual spread that

has opened between prices for natural gas, petroleum, and coal (see **Figure 14**). Prior to 2008, natural gas prices tended to track oil prices. Since then, natural gas prices have dropped while oil prices have remained high, opening a large differential between these two prices. Similarly, for most of the period between 1973 and 2008, coal was traded at a substantial discount relative to natural gas. Coal prices reached parity with natural gas prices briefly during the spring of 2012.

This historical record also suggests that there is considerable risk surrounding the proposition that the currently wide spread between prices for natural gas, coal, and petroleum could persist for many years into the future. Indeed, a plot of the price spreads between natural gas, coal, and oil plotted in **Figure 15** illustrates that since the spring of 2012, the natural gas to coal price spread is reverting to its long-run mean of 2.21 (see **Figure 15**). The price spread between natural gas and oil is also increasing but remains well below the historical average. In the section below a more detailed analysis of the risks and costs associated with an over-reliance upon natural gas in power generation is discussed.

7. Value of PRB Coal to the U.S. Economy

The value of any economic activity is based upon the opportunity costs of providing alternative goods or services. There are many electric power technologies that could be considered as potential replacements for coal-fired power generation. While there may be growing public support for nuclear power, long lead times for permitting and construction incur significant capital costs. Wind power may not be a viable option because it may be incapable of replacing base load capacity given its intermittent production profile. Thermal solar and photovoltaic power systems have even higher cost and have the same intermittency problems that wind power faces. Hence, the next best alternative to PRB coal is natural gas.

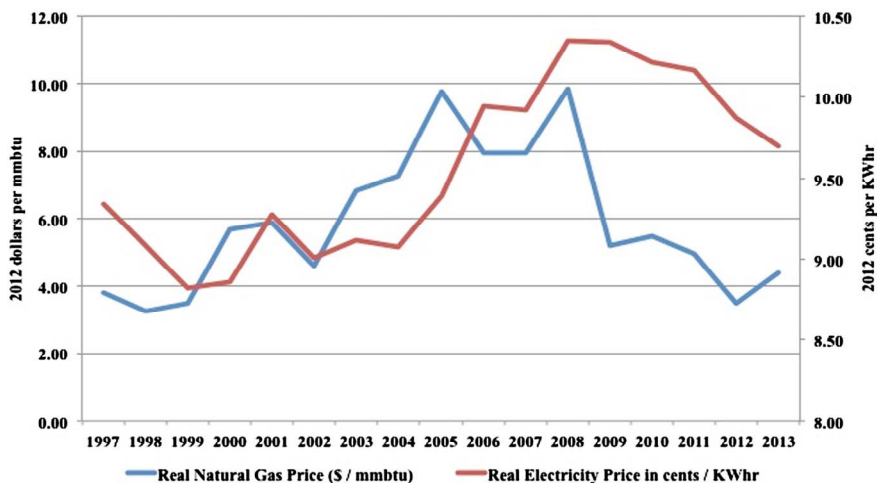


Figure 13. Real Prices for Electricity and Natural Gas, 1997-2013 [32,33].

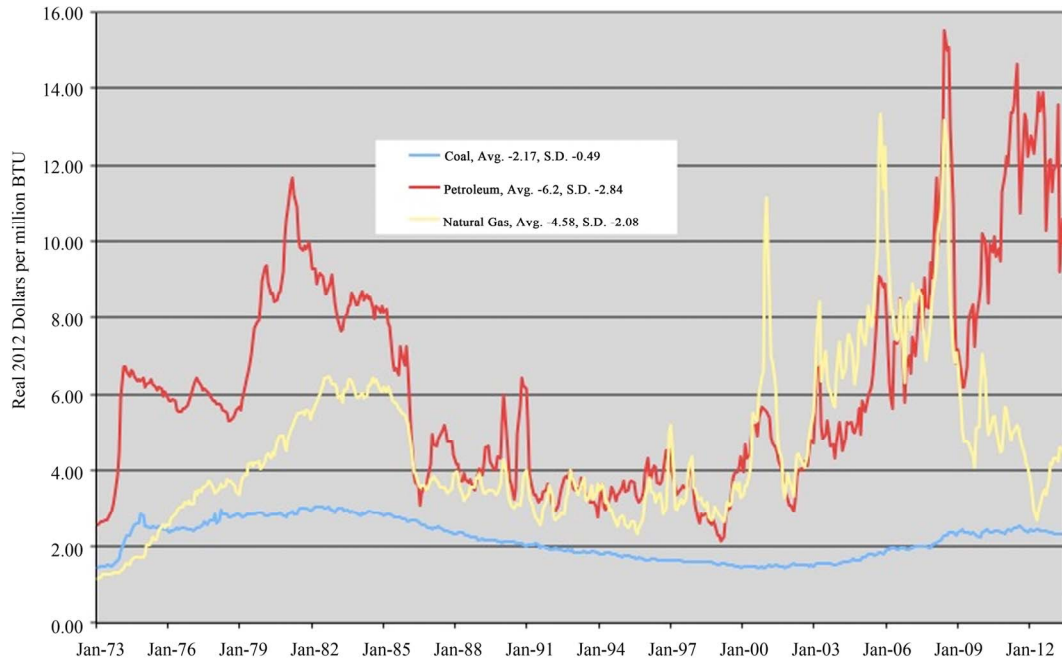


Figure 14. Prices Paid for Fossil Fuels by Electric Utilities, 1973-2013 [34,35].

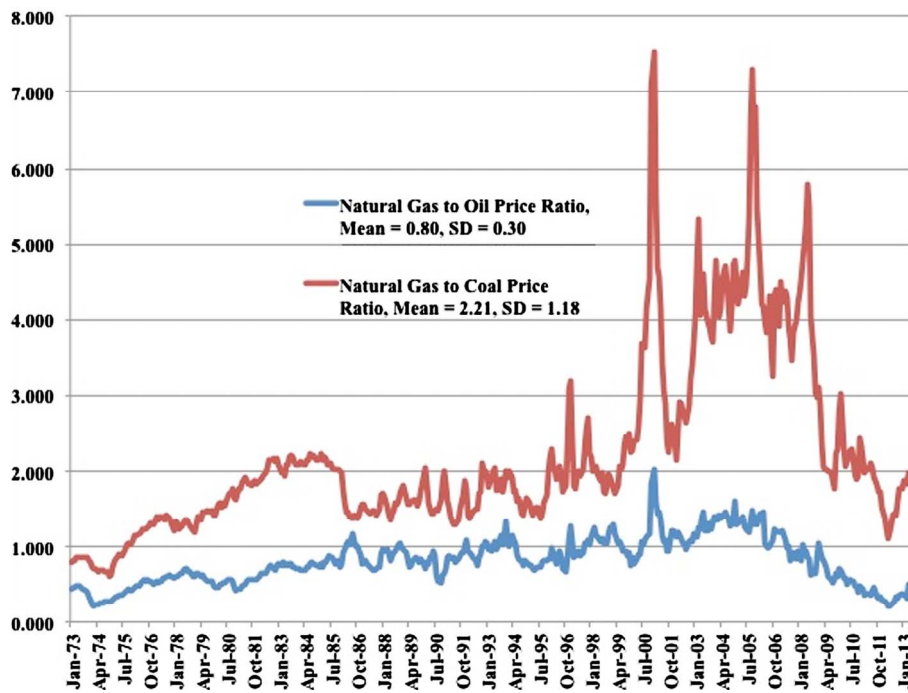


Figure 15. Price Spreads for Fossil Fuels Consumed by Electric Utilities, 1973-2013 [34,35].

Until the spike in wind power capacity additions since 2008, most new electric-generating capacity since the mid 1990s has been fired with natural gas. Electric power generation is now the single largest end-use of natural gas in the United States. Therefore, to estimate the value of PRB coal to the U.S. economy, this study estimates the impact on average retail electricity rates from phasing-out PRB coal in power generation and replacing it

with natural gas.

How much natural gas would be required to replace PRB coal? During 2011, PRB coal was used to generate 676,471 million kilowatt hours of electricity, which is 18% of total electricity consumption in the U.S. The base year for this analysis is 2011 because wellhead prices for natural gas at \$3.95 were closer to the historical mean than the \$2.66 low reached during 2012. Given the ther-

mal efficiencies of existing natural gas capacity, replacing PRB coal-based generation would require slightly more than 5.5 trillion cubic feet of natural gas per year. This expansion of natural gas use would require a 26.2% increase in U.S. natural gas supplies from 2011 production levels.

Such a dramatic expansion of natural gas use would bid up prices. The extent of the price increase depends upon the responsiveness of natural gas supply to price, or the price elasticity of supply. To determine this elasticity, this study computed the percentage changes in price and production between the Energy Information Administration’s reference case forecast [36] with the high and low demand scenarios. Such a comparison allows a controlled experiment in which exogenous factors affecting supply are held fixed while demand is varied, similar to the case under study here in which the demand for natural gas would increase to replace PRB coal. The results indicate that the median supply elasticity is 0.345. In other words, for every ten percent increase in natural gas prices, producers expand production almost 3.5 percent.

To achieve a 26% increase in natural gas production to replace PRB coal, therefore, wellhead natural gas prices would have to increase 76% ($26.2\%/0.345$), increasing wellhead natural gas prices from an average of \$3.95 per thousand cubic feet (mcf) during 2011 to over \$6.7 per mcf. Assuming the costs of transporting and distributing natural gas are constant, this wellhead price increase would increase natural gas prices paid by residential, commercial, industrial, and electricity producers by 27%, 33%, 59%, and 61% respectively.

These estimates may be conservative because natural

gas prices peaked at over \$12 per mcf in nominal terms several times over the past three years without a major expansion in demand. Moreover, the upward pressure on natural gas prices could be even greater if it occurred after additional consumption of natural gas emerged from the industrial sector. Many chemical producers are beginning to increase their use of natural gas to produce ethylene and other chemical products. Similarly, several large transportation companies are converting their vehicles to use compressed and liquefied natural gas (LNG). There are also several large LNG export terminal under construction that will become operational over the next few years.

These higher natural gas prices would increase electricity rates. Electricity producers and consumers would have to pay for new capacity and for the higher costs of running new and existing capacity at higher natural gas prices. The central part of the United States with most of our nation’s manufacturing capacity would be most affected by replacing PRB coal with natural gas. Average retail electricity rates would increase 64% in the west north central states, 29% in the west south central states, 21% in the east north central states, and 14% in the east south central states (**Figure 16**).

Even though other regions do not directly consume PRB coal, higher natural gas prices would force up electricity rates in these areas. For example, average retail electricity rates would increase on average 7% in New England, the Mid-Atlantic, South Atlantic, and Pacific regions. Nationwide, eliminating PRB coal use would drive up average retail electricity rates by more than 17%.

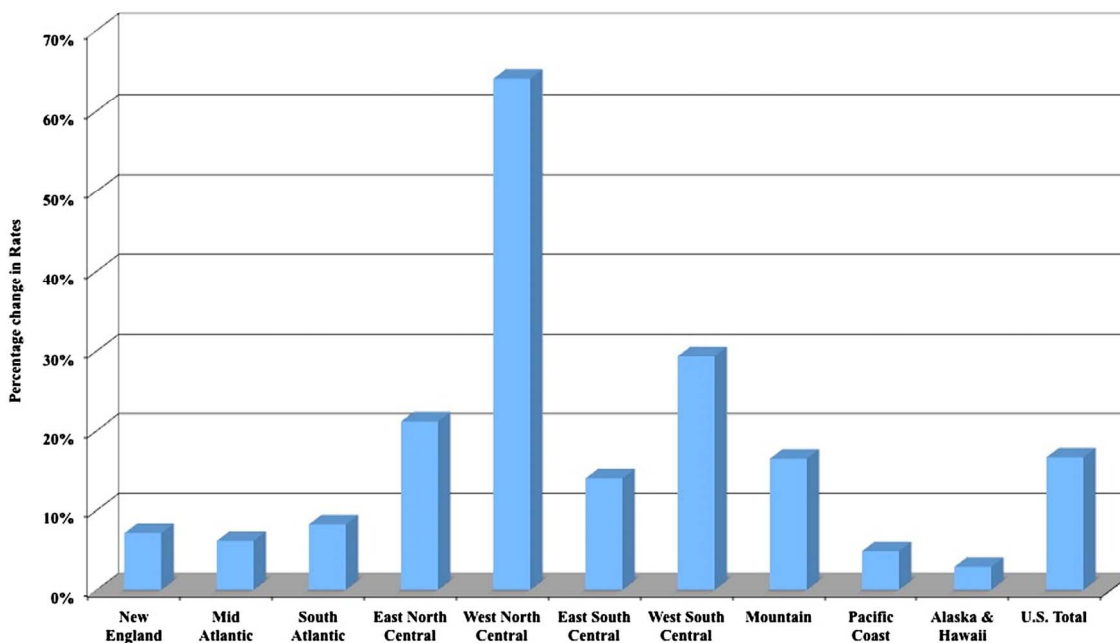


Figure 16. Changes in 2011 Electricity Rates from Replacing PRB Coal with Natural Gas.

These opportunity cost calculations reveal that PRB coal plays an important role in keeping our nation's electricity costs under control, especially for the large industrial users in the central part of the United States. Without PRB coal, the very low electricity rates that keep large industrial users competitive in world export markets would be replaced by substantially higher rates (see **Figure 17**).

The decomposition of average retail electricity rate changes by region appears in **Table 2**. The second column of **Table 2** reports the actual average retail electricity rate by region during 2011, which can be considered as the base case using PRB coal. The third column presents estimates of the rate increase due to replacing PRB coal with natural gas at these higher prices. The size of the increase reflects the relative importance of PRB coal in the electricity generation mix. For example, the rate increases for the West North Central region, which includes Iowa, Illinois, Kansas, Missouri, Nebraska, and Wyoming, are substantial because PRB coal-based generation constitutes such a large share of their portfolio of electric power generation assets.

Given higher natural gas prices, the costs of operating existing gas-fired capacity across the nation also would increase. The incremental effect of these cost increases on electricity rates appear in the fourth column of **Table 2**. For example, rates increase one cent per kilowatt-hour in New England even though that region does not consume PRB coal. The combined impact of these two components on average retail electricity rates and their percentage increases appear in the last two columns of **Table 2**. In a world without PRB coal, average retail

electricity rates for many states would be higher than what they are today (see **Table 2**).

These electricity rate increases imply that consumers in the U.S. would pay \$62 billion more each year for electricity. In addition, consumers of natural gas would pay \$45 billion more per year because natural gas prices would be higher without PRB coal. So in total, by using PRB coal, the U.S. economy avoids \$107 billion per year in higher energy costs. In addition to these costs are the avoided macroeconomic impacts, such as reductions in industrial output and employment that would result from large industrial users relocating to other nations with relatively lower electricity rates.

Replacing PRB coal with nuclear power, solar thermal, or wind power would pose a daunting challenge and would raise electricity rates considerably more. The value of PRB to society includes the avoided costs from replacing this energy and the avoided adverse economic impacts from higher electricity rates and natural gas prices. As the natural gas example illustrates, the additional costs from producing more than 5.5 TCF of natural gas and associated impacts on electricity rates are significant. Replacing PRB coal with other energy resources implies some rather implausible resource requirements such as:

- 91 one-thousand megawatt capacity nuclear power plants operating at 85% capacity, or
- 169 hydroelectric plants the size of Hoover dam producing 4 billion kwhr per year, or
- 368,815,104 cords of wood, or
- 193,057 wind turbines each at 2 MW operating with a 20% capacity factor.

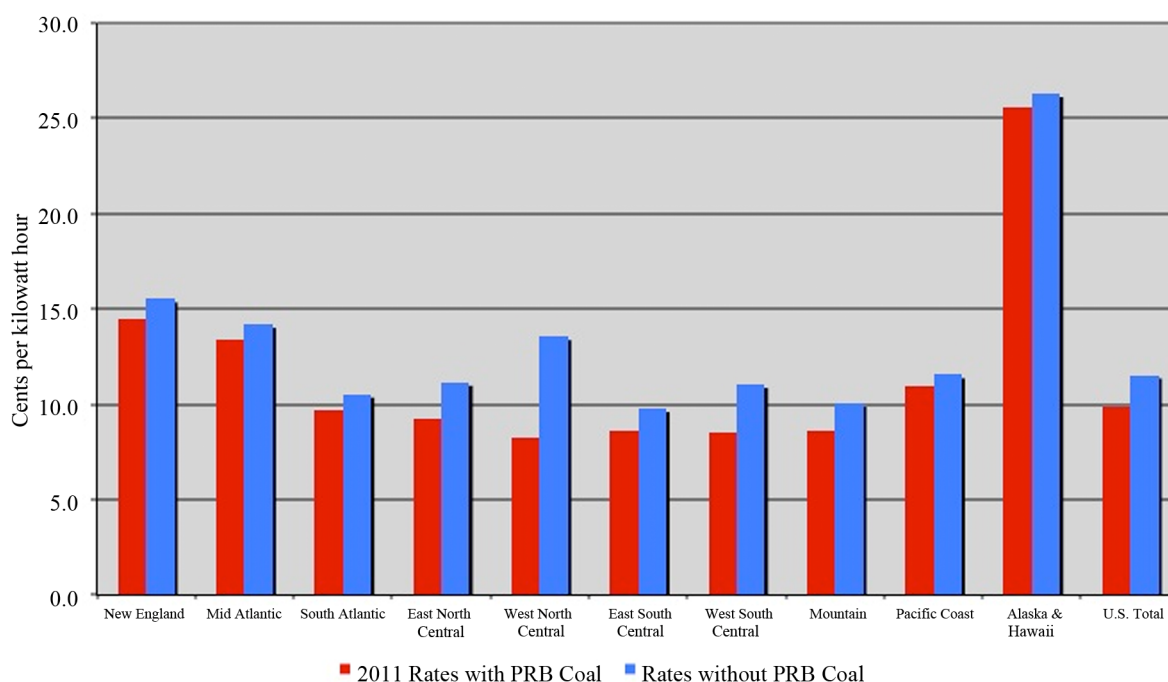


Figure 17. Electricity Rates by Regions with and without PRB Coal.

Table 2. Average Retail Electricity Rates with and without PRB Coal.

cents per kilowatt hour					
Rate Increases due to					
State	Base Rates with PRB Coal	Direct Replacement of PRB Coal	Higher Costs for Existing NG Capacity	Rates without PRB Coal	Percentage Increase in Rates
New England	14.5	0.0	1.0	15.5	7%
Mid Atlantic	13.4	0.1	0.8	14.2	6%
South Atlantic	9.7	0.2	0.6	10.5	8%
East North Central	9.2	1.8	0.2	11.2	21%
West North Central	8.3	5.2	0.1	13.6	64%
East South Central	8.6	0.7	0.5	9.8	14%
West South Central	8.5	1.6	0.9	11.0	29%
Mountain	8.6	0.8	0.6	10.1	17%
Pacific Coast	11.0	0.1	0.5	11.6	5%
Alaska & Hawaii	25.6	0.0	0.7	26.3	3%
U.S. Total	9.9	1.1	0.6	11.5	17%
New England	14.5	0.0	1.0	15.5	7%

The hydroelectric option is not feasible because capacity is already maximized. Harvesting over 350 million cords of wood per year is not sustainable because such a rate would deplete the entire stock of standing forests in the U.S. in slightly over three years. Wind generation faces technical challenges because some form of backup generation would be required. This leaves nuclear power as the only technically feasible alternative to natural gas in replacing PRB coal. The cost of dramatically expanding nuclear electricity capacity, however, is likely to be quite significant due to insufficient engineering construction infrastructure and very long lead times for licensing and construction.

8. The Net Benefits of PRB Coal

This study documents the rise of PRB coal and estimates its value to the U.S. economy. Rather than focusing on value added in coal mining, the study assessing value in terms of opportunity costs. In other words, the value of PRB coal is equal to cost of supplying energy from the next best alternative and, in this case, that is natural gas. Using average wellhead natural gas prices during 2011, this study estimates that the value of PRB coal to the U.S. economy is \$107 billion per year. These benefits rise substantially with the price of natural gas and even more so if the next best alternative to PRB coal is nuclear or renewable energy.

These benefits, however, should be considered in light of the social costs arising from the environmental impacts from coal pollution. Muller *et al.* [37] report that the gross environmental damages from U.S. coal-fired electric power generation amount to \$53.4 billion in 2000 dollars, which is \$68.3 billion in 2011 dollars, under their base case analysis. These costs include impacts arising from criteria and greenhouse gas emissions. Given that PRB coal is used to generate 40% of coal-fired electric

power generation in the U.S., the gross environmental damages from utilizing PRB coal are \$27.4 billion. Thus, under the base case assumptions, the economic benefits of PRB coal in terms of moderating overall energy costs in the U.S. economy exceed the social costs arising from the environmental impacts by nearly a factor of four.

Under the high and low estimates for gross environmental damages developed by Muller *et al.* [37], this benefit-cost ratio would range from 1.5 and 11 (see column three in **Table 3**). Under the low natural gas prices experienced during 2012, the benefit-cost ratio with high environmental damage estimates is 1.2 (see column 2, **Table 3**). Hence, even under rather stringent assumptions for environmental damage costs and low natural gas prices, the net social benefit-cost ratio for PRB coal remains above unity. This finding suggests that under a rather wide range of economic conditions and environmental impacts, the social benefits of using PRB coal are significantly greater than the social costs in terms of environmental damage costs.

9. The Challenges and Opportunities

The expected net benefits of using PRB coal that consider both economic and environmental impacts, average slightly over \$79 billion, ranging from \$16 to \$133 billion depending upon natural gas prices and the valuation of environmental impacts. Clearly, utilizing PRB coal makes economic sense even after factoring in the environmental impacts.

Significant challenges lie ahead. First and foremost are proposed regulations on criteria air pollutants and greenhouse gas emissions. The broad reach of these regulations is creating a great deal of uncertainty and a reluctance of electric power producers to operate coal power plants much less invest in new ones. For example, there is a three-year compliance deadline under Utility Maxi-

Table 3. Social Benefit-Cost Ratios for PRB Coal.

Natural Gas Prices (\$/mmbtu)	\$2.66	\$3.95	\$8.07
Benefits (billion)	\$86.20	\$106.50	\$145.48
Environmental Damages (billion)	Benefit/Cost Ratios		
\$9.71	8.9	11.0	15.0
\$27.40	3.1	3.9	5.3
\$70.11	1.2	1.5	2.1

imum Achievable Control Technology (UMACT) regulations so investments made to comply with these standards could be stranded by new source performance standards for greenhouse gas emissions. As a result, announced and expected coal-fired power plant retirements are from 50 to 75 gigawatts (GW) [38]. Pham and Ikenon [39] find that the combined cost of implementing these regulations are not commensurate with their economic and health benefits.

While technologies exist for capturing carbon dioxide (CO₂) from electric power plants, they are not yet deployed in the United States. In contrast, the technology for transporting and injecting CO₂ is commercialized in certain markets. Dedicated pipelines exist for transporting carbon dioxide and injecting carbon dioxide into oil reservoirs for enhanced oil recovery. Hence, the technology exists for capturing, transporting, and storing CO₂ but large-scale fully integrated systems with electric power plants are not yet deployed given the lack of economic incentives.

While the proposed EPA rules for greenhouse gas emissions may be overturned on legal grounds, the threat of future regulatory standards would most likely seriously stall any plans to invest in new coal-fired capacity. Indeed, one could argue that the coal industry could be better off under a market-based system of CO₂ permits that could provide more certainty. The neutralizing of the SO₂ permit trading system by more stringent regulatory standards, however, casts a pall over the expected longevity of any market-based trading system for carbon dioxide [40]. Given this uncertainty, why would firms invest in coal-based technologies to reduce greenhouse gas emissions? The abandonment of market-based solutions and the adoption of rigid regulatory standards impose significant efficiency losses on the electric power system and the U.S. economy.

Another challenge is that natural gas use in power generation will continue to expand [41]. While significant shale gas discoveries may allow such expansion, natural gas prices are prone to spike. Natural gas prices over the long run move with oil prices but do exhibit significant departures from heat equivalent parity with oil due to natural gas supply and demand imbalances.

Given the size of the international coal market and the highly competitive costs of PRB coal production, Wyo-

oming and Montana have the potential to export significantly greater amounts of PRB coal. One of the key bottlenecks in making higher coal exports a reality involves getting approval of coal port expansions in the Pacific Northwest and the Gulf Coast region in Texas and Louisiana. Canada is another route PRB coal could take to foreign markets. According to Schaefer [42] there is more than 150 million tons of coal export capacity proposed in Oregon and Washington. Even if half of this capacity is built and with additional export capacity in the Gulf Coast region and even Canada, the loss of domestic coal sales could conceivably be more than offset with expanded exports of PRB coal.

While the reserves of coal and natural gas worldwide are ample, there is growing concern that world supplies of light sweet crude oil likely will reach a peak sometime before 2050. This is of particular concern as the Chinese and other Asian economies enjoy rising levels of affluence and with this a growing desire for mobility and liquid transportation fuels.

Despite the renaissance of the American oil industry, finding a cost effective and environmentally acceptable substitute for liquid petroleum fuels will be a key challenge for the world economy in the decades ahead and a significant opportunity for PRB coal producers, either through direct manufacturing of liquid fuels from coal or indirectly through the production of electricity for electric vehicles.

10. Conclusions

PRB coal has contributed to lower electricity prices nationwide and in particular in the Midwest, South, and Western U.S. These lower electricity prices have spurred productivity growth by encouraging the continued electrification of our economy. High productivity levels have been important in maintaining U.S. industrial competitiveness and in retaining manufacturing in America. The energy and material efficiency of U.S. manufacturing is the highest in the world and is a key source of strength as U.S. companies compete in world markets. PRB coal plays an important role in maintaining this industrial leadership and the export capability of the U.S. economy.

Powder River Basin coal plays a key role in providing affordable and reliable energy for the American economy. The opportunity cost of not using PRB coal would involve substantially greater use of natural gas that would bid up natural gas prices. This study estimates that these opportunity costs are \$107 billion. Hence, the value of PRB coal to the U.S. economy is that energy costs are \$107 billion lower than they would be without PRB coal. The environmental damage costs associated with PRB coal use amount to \$27 billion. Hence, the net social benefit of using PRB coal is \$80 billion. Under low natural gas and high environmental damage cost estimates,

the net social benefits of PRB coal are \$16 billion. If natural gas prices double from current levels and lower environmental damage cost estimates apply, the net social benefits rise to over \$140 billion. So under a range of assumptions and scenarios, the net social benefits of using PRB coal remain positive.

Given the sheer size of this energy reserve, the Powder River Basin will likely continue to provide energy for future generations both here in the United States and particularly abroad, as these low-cost, relatively clean coal energy resources are exported to developing countries.

The demonstrated success of PRB producers in providing high volumes of low-cost coal and the ingenuity of coal users to adapt to the changing environmental standards and market conditions are sound reasons to remain cautiously optimistic about future prospects for PRB coal as long as policy makers keep in mind that using these resources generates net social benefits under current technology.

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Subject: TWS Coal PEIS Scoping Comments
Date: Thursday, July 28, 2016 7:27:46 PM
Attachments: [The Wilderness Society - Coal PEIS Scoping Comments 7-28-16-final.pdf](#)

Dear Shannon, Alexandra, Linda and Christina – We wanted to share the scoping comments that The Wilderness Society submitted today on the Coal Programmatic EIS. As you can see from the attached, we are very supportive of the BLM’s efforts to reform this program and have a number of recommended reforms addressing fair return and climate change impacts, as well as development of a regional leasing program that can build on the agency’s landscape level planning efforts and mitigation policy to ensure that the program is truly conducted in the public interest.

We look forward to continuing to engage in this process and very much appreciate your attention.

Nada Culver

Senior Counsel and Director, BLM Action Center

The Wilderness Society

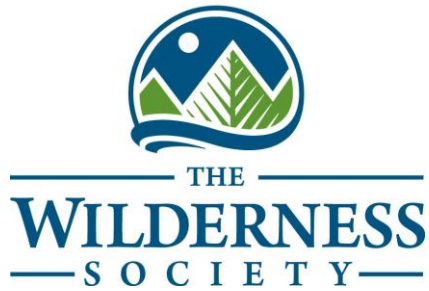
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Via electronic mail ([BLM WO Coal Program PEIS Comments@blm.gov](mailto:BLM_WO_Coal_Program_PEIS_Comments@blm.gov))

Coal Programmatic EIS Scoping
Bureau of Land Management
20 M Street SE
Room 2134LM
Washington, D.C. 20003

Re: Scoping Comments for the Federal Coal Program Programmatic Environmental Impact Statement

To Whom It May Concern:

Please fully consider these scoping comments from The Wilderness Society regarding the Federal coal program Programmatic Environmental Impact Statement (PEIS) being prepared by the Bureau of Land Management (BLM). The Wilderness Society's more than 500,000 members and supporters nationwide care deeply about the management of our public lands. Founded in 1935, our mission is to protect wilderness and inspire Americans to care for our wild places. We appreciate the opportunity to submit these comments and the efforts the BLM is undertaking to review a program that has not been fully assessed for more than twenty years.

I. INTRODUCTION AND OVERVIEW

A. Evaluating and Reforming the Federal Coal Program – a Timely and Urgent Task.

Any and all coal leasing must be conducted "in the public interest." 30 U.S.C. § 201(a)(1). Accordingly, BLM cannot simply continue to lease and permit coal operations on public lands without evaluating the consequences of the program and considering needed changes. Further, public interest includes a wide range of social and environmental concerns, not just the interest or profits of private companies or simply dollars deposited in the federal treasury. As the Federal Land Policy and Management Act (FLPMA) acknowledges in the context of BLM's multiple use mandate, the public lands must be managed "with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output." 43 U.S.C. § 1702(c). We support the BLM's evaluation of the coal program in a manner that looks at the benefits from needed reforms in a holistic manner.

On March 17, 2015 Secretary of the Interior Sally Jewell asked for an “honest and open conversation” regarding the federal coal program. Her call was followed by a series of listening sessions in several communities, primarily in the west. In the State of the Union address on January 12, 2016 President Barack Obama announced,

Rather than subsidize the past, we should invest in the future—especially in communities that rely on fossil fuels. We do them no favor when we don’t show them where the trends are going. That’s why I’m going to push to change the way we manage our oil and coal resources, so that they better reflect the costs they impose on taxpayers and on our planet.

On January 15, 2016 Secretary Jewell announced plans to implement a “pause” on new federal coal leasing so that the federal coal program could be reviewed in a multi-year environmental review. The Secretary also issued Secretarial Order (S.O.) No. 3338 (Discretionary Programmatic Environmental Impact Statement to Modernize the Federal Coal Program) which formalized plans to implement the pause and to develop the PEIS.

In the S.O. three main concerns were identified that needed to be addressed in the PEIS: (1) concerns about fair return from the federal coal leasing program; (2) concerns about climate change due to federal coal production; and (3) concerns about market conditions affected by the federal coal program. In the notice of intent to prepare the PEIS (81 Fed. Reg. 17,720 (Mar. 30, 2016)), the BLM reiterated the issues that had been identified in the S.O. and also listed a number of approaches that were being considered for reforming the federal coal program, including: raising royalty rates, changing methods for determining fair market value for minimum bids on coal leases, raising rental rates, and changing the methodology for determining how much federal coal or acreage is made available for leasing. As noted above, this type of broad scope of review is needed to ensure that the coal program is meeting the public interest, including the important policy commitments made to balance energy development with conservation, ensure mitigation of impacts to the public lands, and to combat climate change.

As the BLM has noted, there have been prior reviews of the federal coal program where a leasing “pause” was put in place. These occurred in the 1970s into the 1980s. Programmatic environmental reviews were prepared as part of those assessments, and the reviews led to the development of the current BLM coal mining regulations, which have largely been in place since 1979. *See* 43 C.F.R. Part 3400 (presenting the BLM’s coal management regulations). Similar changes may be required to BLM’s regulations as a result of this PEIS, in addition to changes to existing policies and procedures that will not require formal rulemakings.

In recent years about 41 percent of the Nation’s coal was produced on federal public lands and this coal was used to generate about 14 percent of the Nation’s electricity in 2015. This coal is produced from 306 leases covering 482,691 acres of public land in 11 states, with 7.75 billion tons of coal estimated to be recoverable. Nevertheless, coal production has been dropping in recent years and this trend is predicted to continue. Coal production in the U.S. was 10 percent lower in 2015 than in 2014 (the lowest level since 1986) and the Energy Information Administration predicts coal production will drop another 12 percent in 2016. But coal reserves

currently under lease are estimated to be sufficient to continue production at current levels for 20 years. In 2012 as much as 21 percent of the Nation’s greenhouse gas (GHG) emissions originated from coal, oil, and natural gas extracted from the public lands, with coal contributing over 57 percent of this. Federally-produced coal is contributing roughly 10 percent to U.S. GHG emissions. While, based on the foregoing predictions, coal production is likely to continue to decrease, its impacts on public lands and contributions to GHG emissions remain significant; therefore, the federal coal program is in need of timely, comprehensive reform.

B. Principal Recommendations.

While we include specific recommendations with each section of these comments, we wanted to highlight some of the key recommendations for the preparation of the PEIS and reform of the federal coal program, which include:

- The coal program must be designed and implemented in the “public interest” and must provide a fair return to taxpayers.
- The process for determining lands “acceptable for further consideration for leasing” must be fully complied with at the land use planning and leasing stage, including applying and updating the unsuitability criteria, considering effects on other multiple uses and developing a reasonably foreseeable development scenario
- The BLM should “take control” of the federal coal leasing program and develop a multi-year leasing program that replaces the current, industry-driven lease by application process, and can incorporate applicable elements from the Solar PEIS and oil and gas Master Leasing Plans.
- BLM must put in place a regional mitigation strategy based on landscape scale analyses to support coal leasing decisions, and coal leasing must proceed only if it is shown there will be a “net benefit” to society resulting from leasing and development.
- BLM must address climate change impacts and commitments by tracking emissions, analyzing impacts, developing a carbon budget and applying compensatory mitigation where impacts cannot be avoided or sufficiently minimized.
- The PEIS should include planning for a future with declining coal production, addressing socio-economic impacts and considering tools to assist coal-dependent communities.

II. SCOPING IS A FUNDAMENTAL REQUIREMENT OF THE NATIONAL ENVIRONMENTAL POLICY ACT AND WILL HELP DEFINE THE PURPOSE AND NEED AND RANGE OF ALTERNATIVES FOR THIS PROGRAMMATIC EIS.

Scoping for preparation of an environmental impact statement (EIS) is required under the Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) regulations. 40 C.F.R. § 1501.7. It is to be an “early and open process.” *Id.* Scoping serves to identify the scope of the issues to address in an EIS, and the significant issues that are related to a proposed action. *Id.* §1501.7(a)(2). A number of mandatory and discretionary activities related to scoping are specified in the CEQ regulations, most importantly the need to fully engage with cooperating agencies, tribes, and the general public early in the scoping process.

Specifics of the scope of an EIS are also defined in the CEQ regulations. The scope of a project “consists of the range of actions, alternatives, and impacts to be considered in an [EIS].” 40 C.F.R. § 1508.25. The regulations state that scope consists of three types of actions, three types of alternatives, and three types of impacts. *Id.* Actions include connected actions, cumulative actions, and similar actions. Alternatives include the no action alternative, other reasonable courses of action, and mitigation measures that are not described in the proposed action. Impacts include direct, indirect, and cumulative effects. The three actions--connected, cumulative, and similar--are defined in detail in the regulations, and these will have particular significance for the consideration of climate change impacts of the federal coal program.

The BLM has also established requirements for scoping in its NEPA Handbook. BLM Handbook H-1790-1. Scoping is to help identify incomplete or unavailable information, help identify alternatives to be considered in the EIS, and refine the proposed action. BLM NEPA Handbook at 38. Importantly, scoping also helps initiate consideration of cumulative impacts. *Id.* BLM is to “use scoping to begin identifying actions by others that may have a cumulative effect with the proposed actions, and identifying geographic and temporal boundaries, baselines and thresholds.” *Id.* at 38 and 89. BLM views scoping as having both internal and external (to the agency) components, and external scoping “is to be used to identify past, present, and reasonably foreseeable actions by others that could have a cumulative effect.” *Id.* at 40. Connected and similar actions are recognized as important during scoping in the BLM NEPA Handbook. *Id.* at 39.

The scope of the analysis in the federal coal program PEIS will clearly have a significant role in defining the Purpose and Need for this project and the proposed action. It will also play a significant role in defining the alternatives considered in the PEIS. The Purpose and Need for this PEIS will be discussed later in these comments in section XI. Issues that should be considered in developing alternatives to consider in the PEIS will be addressed in section VII. Additionally, the recognition in the BLM Handbook that scoping is to be used to identify “reasonably foreseeable actions” has significance relative to defining the reasonably foreseeable development level of coal that can be expected from the federal coal program, an important issue that will be discussed in section IV.I. of these comments.

Recommendations: In discussing the scoping report that the BLM will provide, the agency’s factsheet provides that it “will release an interim report by the end of 2016 with conclusions from the scoping process about alternatives that will be evaluated and, as appropriate, any initial analytical results.”¹ The BLM’s scoping process should summarize input received and also provide initial information regarding purpose and need and alternatives so that the public can be informed regarding the direction the agency will take in completing this PEIS and BLM will have a roadmap to follow.

¹ See, FACT SHEET: MODERNIZING THE FEDERAL COAL PROGRAM, available at: http://www.blm.gov/style/medialib/blm/wo/Communications_Directorate/public_affairs/news_release_attachments.Par.47489.File.dat/Coal%20Reform%20Fact%20Sheet%20Final.pdf

III. OVERARCHING ELEMENTS OF THE COAL PROGRAM THAT SHOULD BE REVIEWED AND UPDATED IN THE PEIS

Due especially to the time since the last programmatic review, many of the central, underlying elements of the federal coal program need to be reviewed and updated in the PEIS. These include the definition of “public interest,” fair market value, royalties, rental rates, bonus bids, bonding standards and qualifications to hold a federal coal lease. Ensuring these elements are defined and updated in a manner that fulfills the BLM’s commitments and obligations as steward of our public lands is a vital part of ensuring the federal coal program is operated responsibly.

A. Operating the Coal Program in the “Public Interest” Should Be Explicitly Prioritized and More Clearly Defined.

All coal leasing is to be done “in the public interest.” 30 U.S.C. § 201(a)(1). The BLM should explicitly recognize this guiding purpose of the federal coal program in the PEIS and better define what the public interest means in this context, which is not limited to economic returns on coal leasing and development. FLPMA directs the BLM to consider a range of values in making land use allocation and management decisions and recognizes that looking solely at economic return is not sufficient. Public interest can often be served by managing for other uses, many of which may also provide economic benefits, such as recreation.

In many prior EISs the BLM has said that the public interest was served by coal leasing and development due to economic benefits that were predicted. But what has often been missing is a consideration of when there are *not* public benefits from coal leasing and development and there are benefits from more strictly managing those activities. In assessing how the public interest will be served, the BLM should give as much attention to a lack of benefits resulting from coal leasing and development activities, and/or the benefits from limiting them, as it does to the economic benefits from the activity. The negative externalities of coal development such as increased air pollution and water pollution and the destruction of natural landscapes and habitats should be recognized as *not* being in the public interest, while limiting them and providing more opportunities for protecting other values should be recognized as in the public interest. This analysis should factor in to deciding whether areas are or are not appropriate for leasing, as well as in deciding the terms of leases and other management of activities if areas are identified as appropriate for leasing. As part of the BLM’s “acceptable for further consideration for leasing” determination in its land use planning process, lands that would not further the public interest if they were leased (as opposed to managed for other uses) should be excluded from further consideration for leasing.

Recommendations: Serving the “public interest” is a lynchpin precept of the federal coal program and it must be recognized in all phases and aspects of the federal coal program, including when considering environmental protections. It should therefore be highlighted as a foundational consideration in the PEIS and explicitly defined to include not only the economic benefits from development but also the important context of resulting harms from development and benefits (economic and otherwise) from limiting development.

B. The Coal Program Must Yield a Fair Return.

In addition to the specific economic aspects of the federal coal program discussed in detail below, there is an overall mandate to achieve “fair return” from coal development. The most significant term that is used in the Mineral Leasing Act (MLA) as well as in the BLM coal regulations is “fair market value.”² No bid for a lease “shall be accepted which is less than the fair market value, as determined by the Secretary, of the coal subject to the lease.” 30 U.S.C. § 201(a)(1). *See also* 43 C.F.R. § 3422.1(c)(1) (same). The FLPMA establishes a policy that, “the United States receive fair market value of the use of the public lands and their resources” 43 U.S.C. § 1701(a)(9)

This concept is fundamental to the BLM coal leasing program and to federal coal development. It should therefore be explicitly addressed in the PEIS. The importance of achieving fair market value was recognized in both S.O. 3338 and in the BLM’s Federal Register notice of the development of the PEIS. Further, the White House Council on Economic Advisors released a report documenting the need for royalty reforms if taxpayers are to receive fair market value from the federal coal program. This report is called *The Economics of Coal Leasing on Federal Lands: Ensuring a Fair Return to Taxpayers* (June, 2016). The report notes that, “[a] review of the coal leasing program indicates that the program has been structured in a way that misaligns incentives going back decades, resulting in a distorted coal market with an artificially low price from most Federal coal and unnecessarily low government revenue from the leasing program.”

Concerns about fair market value were raised in 2013 in reports issued by the Government Accountability Office and the Department of the Interior’s Office of the Inspector General. These reports were noted in the S.O. The concern about fair market value stems from the fact that approximately 90 percent of lease sales receive bids from only one bidder, typically the operator of a mine adjacent to the new lease. In addition, the leasing of large amounts of low cost coal may be artificially driving down coal prices in the U.S. markets. Therefore, minimum bids that are not based on a competitive bidding process may not reflect fair market value. The BLM also identified potentially changing the methodology for determining fair market value when establishing the minimum bid or valuing lease modifications in the Notice of Intent, along with other issues related to fair return (some of which are discussed below). 81 Fed. Reg. at 17,726.

The Office of Natural Resources Revenue has recently released new rules that will regulate the valuation for royalty purposes of federally produced oil, gas, and coal. 30 C.F.R. Parts 1202 and 1206. Under the new rule, royalty valuation will be determined by point of sale at or near where the lease is located and will be based on arms-length contracts, which are the best indicators of market value. <http://www.onrr.gov/about/pdfdocs/20160630.pdf>. These new regulations also address aspects of fair market value for the federal coal program and can complement the additional actions BLM takes in the PEIS.

Recommendations: The BLM should highlight the need for the coal program to provide a fair return to taxpayers and use it as an overarching consideration in the PEIS. BLM should adopt

² “Diligent development,” “commercial quantities,” and “minimum bids” are also important concepts that arise here. *See generally* 30 U.S.C. § 202a(2); 43 C.F.R. Subpart 3487; 43 C.F.R. §§ 3480.0-6(d) and (d)(5) and Subpart 3483; 30 U.S.C. § 207(a); and 43 C.F.R. §§ 3430.1-1, 3430.1-2 (presenting these terms).

changes that will ensure this goal is met in analyzing each aspect of the program, including as recommended in further detail below. At a minimum, this includes showing fair market value is being achieved for each element of the program. However, since fair market value is a technical standard, we recommend that, overall, the program should ensure there is a fair return to taxpayers.

C. Royalty Rates Must Provide a Fair Return to Taxpayers.

Royalties must be paid on coal that is produced from federal coal leases. 30 U.S.C. § 207(a). Royalty rates are nominally 12.5 percent on coal mined from surface mines and 8 percent from underground mines. Unfortunately, however, the current effective rate of royalty payments is only 4.9 percent of the value of the coal that is mined—just \$ 1.70 per ton.³ It has been estimated that taxpayers have been shortchanged by nearly \$ 30 billion over the last three decades due to limited royalty, bonus bid, and rental payments from the federal coal program. Part of the reason for these low royalty payments is the availability of subsidies and deductions that lower the royalty rate. In total, because of these problems, Americans are not receiving the fair market value of their coal.

Consequently, there is likely a need to increase royalty rates on federally produced coal. One potential approach would be to apply the 18.75 percent rate that applies to oil and natural gas produced from offshore leases, which indicates a reasonable rate. The BLM should also consider an “adder” to royalty rates that would reflect the negative externalities that the public is exposed to due to federal coal production, such as climate change problems (addressed in detail in section VI.G. below). The BLM should carefully consider raising the royalty rates on federally produced coal (both from surface mining and from underground mining) to a level that will help ensure the public receives the fair market value from federal coal.

The White House Council on Economic Advisors report on the coal program (discussed above) also states its findings “highlight the potential of royalty reform to provide a fair return to taxpayers while simultaneously reducing the environmental effects of coal extraction and combustion.” Modeling results presented in the report show that increasing royalty rates would increase government revenues while “only modestly reducing Federal coal production.” The report presents two possible royalty reform approaches, one based on the full market value of the coal and the other on setting royalty rates to maximize revenues to the taxpayer.

Recommendations: The BLM should raise royalty rates on federal coal production to ensure the public receives fair market value from its coal. An “adder” could be placed on royalties that applies to externalities from coal production, such as emissions of the GHG methane. The PEIS should fully analyze mechanisms for increasing the royalty rate, such that any subsequent rulemakings to change the rates can rely on this analysis.

³ *An Assessment of U.S. Federal Coal Royalties. Current Royalty Structure, Effective Royalty Rates, and Reform Options.* Headwaters Economics. Jan. 2015.

D. Bonus Bids and Rental Rates Must Be Increased.

Two other revenue-producing aspects of federal coal leasing are bonus bids paid when offers are made for federal coal leases and the rental rates paid on federal coal leases. Bonus bids are amounts operators choose to offer when they bid on leases, but which are required to exceed the fair market value of the coal as determined by the BLM. 30 U.S.C. § 201(a)(1), 43 C.F.R. § 3422.1(c)(1). The current rental rate is \$ 3.00 per acre or fraction thereof. 43 CFR § 3473.3-1(a). These amounts are likely not being paid at a sufficient level to ensure the fair market value of federal coal is returned to the government. For instance, the Council on Economic Advisors report mentioned above finds that bonus bids are not providing fair market value for the coal. The BLM should carefully consider in the PEIS whether bonus bids and rental rates are sufficient on federal leases to ensure a fair market value return to the government, and it should initiate any necessary rulemaking that is needed to ensure there is a fair market value returned to the government. Issues related to the bonus bid that is being offered for federal leases will also be addressed in other sections of these comments, but suffice it to say here there is a significant question as to whether these bonus bids are sufficient to ensure fair market value is collected on leases by application (LBA) sales where an existing lessee is the sole bidder on the lease.

Recommendations: The BLM should carefully analyze bonus bids that are being paid for coal leases and rental rates that are paid on leases in the PEIS and determine how those should be increased to ensure that the government receives fair market value from federal coal production. Bonus bids that have been paid by sole bidders in LBA sales should receive special attention.

E. Bonding Levels Should Be Increased; Self-Bonding Should Be Prohibited.

Operators who acquire federal coal leases are also required to provide bonds to ensure their performance meets the terms and conditions of the lease and to ensure environmental protection, namely effective reclamation of disturbed lands. The first type of bond, the performance bond, is required by the BLM. The second type of bond, the reclamation bond, is required by the Office of Surface Mining Reclamation and Enforcement (OSMRE) and is intended to ensure the reclamation requirements of the Surface Mining Control and Reclamation Act (SMCRA) are met. The BLM bonds “shall be furnished in the amount determined by the authorized officer.” 43 C.F.R. § 3474.29(a). The BLM should determine in the PEIS whether current bonding amounts are sufficient to provide assurance that lease terms and conditions are being met. If needed these bonding levels should be increased.

The BLM should have assurance that lease terms and conditions will be met regardless of the future financial status of the operator, including evaluating previous reclamation performance and bond adequacy as part of bidder qualifications (as discussed in more detail below). This is especially important given the large number of bankruptcy petitions being filed by coal companies. If a rulemaking is needed to increase bond amounts, it should be initiated. If direction to state offices is needed, that should occur. The BLM should also consider the conditions of OSMRE reclamation bonds in the PEIS and receive assurance that there will be sufficient reclamation under these bonds, particularly where the BLM is the surface owner of the lands being mined. The BLM should help ensure that reclamation bonds are not released before reclamation is complete.

One issue that has become increasingly significant relative to bonding is the question of “self-bonding.” While this issue apparently applies to the OSMRE reclamation bonds, particularly as administered by the states, the BLM should consider this bonding issue in the PEIS. Self-bonding allows companies to avoid posting sureties as bonds and to instead rely on their company’s paper net worth to provide assurance of reclamation capabilities. But this has become increasingly problematic as the average share value for publicly traded coal companies has plummeted more than 80 percent in the past two years⁴ and as more than half the nation’s production capacity is now in bankruptcy proceedings⁵, leaving significant question as to whether self-bonded companies will have the capability to meet their reclamation obligations leaving taxpayers exposed to significant financial liability. This must not be allowed to happen. A promise to pay should not be allowed to substitute for a bond. Self-bonds are reported to now cover about \$3.75 billion in reclamation obligations in nine states.

This is a highly risky approach to ensuring reclamation obligations are met and it should not be allowed to continue. Under BLM’s bonding regulations the BLM is allowed to set bonding levels sufficient to “assure that the lease bond covers reclamation within a permit area” where the OSMRE tells the BLM that reclamation costs need to be covered because of the lack of a state program. 43 C.F.R. § 3474.3(b)(1). Given the failure of self-bonding, the BLM should strongly consider modifying this regulation to allow it to put in place reclamation bonds where self-bonding has previously been used to guarantee reclamation. The BLM should fully consider in the PEIS whether self-bonding should be permitted on federal lands, and in our view it should not be permitted. The PEIS should provide that the BLM will not lease to self-bonded companies, and if rulemaking is needed to implement this decision it should be initiated. This is the best way to ensure federal lands are reclaimed, as required by SMCRA.

Recommendations: The BLM should carefully consider needed bonding levels in the PEIS, both bonds to ensure compliance with lease terms and conditions, and bonding to ensure reclamation. If needed, bonding amounts should be increased. Assuring environmental protection objectives are achieved and that the companies faithfully meet their lease obligations should be guiding themes. The BLM should put in place a prohibition on the use of self-bonding to meet reclamation bonding requirements on the federal mineral estate.

F. Bidder/Applicant Qualifications Should Be More Detailed and Robust.

Another issue of concern that should be addressed in the PEIS are the requirements to hold a federal coal lease. Many of these are relatively common sense, like being a citizen of the United States or a corporation organized under the laws of the United States. 43 C.F.R. Subpart 3472. Other current requirements relate to limitations on acreage held, ensuring bidders or applications (collectively referred to as bidders) do not already have a coal lease that has not produced, and certifying compliance with applicable laws and regulations. While these are helpful

⁴ Based on performance of Dow Jones U.S. Coal Index as of July 28, 2016, available at <https://www.google.com/finance?cid=4931635>.

⁵ Kuykendall, Taylor and Ashleigh Cotting. “Companies recently filing bankruptcy produce more than 2/3 of PRB Coal.” SNL <https://www.snl.com/InteractiveX/Article.aspx?cid=A-36118340-12086>.

qualifications and limitations, additional criteria should be applied to bidders to hold a federal coal lease, including new leases related to existing mines.

In the Solar Energy Program, the BLM has expanded on its approach to ensuring the financial and technical capability of applicants. Instruction Memorandum No. 2011-060 (Solar and Wind Energy Applications – Due Diligence) elaborates on the BLM’s requirements, which are used to ensure that the agency thoroughly evaluates both financial and technical capabilities before proceeding with an application. A similar approach should be used to screen bidders for coal leases, ensuring that applicants have the financial means to develop and reclaim leases and the technical capability to do so without causing harm to the public lands.

In addition, bidders for coal leases should be further evaluated to ensure they have not been cited for violations of environmental regulations in connection with other operations and have been timely and completely fulfilling reclamation requirements. Finally, the BLM should not issue new leases to companies that already have ten or more years of reserves – those companies do not have an immediate need for access to additional coal and their holdings can further skew markets.

Recommendations: The BLM should strengthen requirements for companies bidding on leases to ensure that they have sufficient financial resources and technical expertise, have not been cited for violations of environmental regulations in connection with other operations, and have been fulfilling reclamation obligations in connection with other operations. Further, BLM should not issue leases to companies that already have ten or more years of reserves.

G. Reclamation Requirements Should Be Strengthened.

A central question related to the environmental protection needs in the federal coal program are reclamation requirements for lands disturbed by mining. While the OSMRE, and states that have been delegated authority, have primary responsibility to put in place reclamation plans pursuant to the SMCRA, the BLM, as a landowner, obviously also has important responsibilities in this regard. The PEIS should address reclamation needs and the degree to which those needs have been met on the federal mineral estate, especially on lands where the BLM holds surface ownership. It should seek to ensure that any unmet needs are met in the future.

No new mining should be permitted if there is not a reasonable likelihood reclamation needs and requirements will be met in a reasonable amount of time. The public should not have to wait for generations for its lands to be reclaimed. As provided for by SMCRA, reclamation should occur contemporaneously with mining, and this should be required by BLM-issued documents, as well.

While the OSMRE and the states may have primary authority to enforce reclamation requirements, the BLM does have obligations when it comes to reclamation. Under the MLA, operators must submit operation and reclamation plans to the BLM “[p]rior to taking any action on a leasehold which might cause a significant disturbance of the environment.” 30 U.S.C. § 207(c). This must be done within three years of a lease being issued. *Id.* BLM’s regulations governing surface management and protection provide that operators can only use surface areas that have been included in “an approved resource recovery and protection plan.” 43 C.F.R. §

3465.1(a). The BLM is given responsibility to enforce these resource recovery and protection plans. *Id.* § 3480.0-6(d)(5). The BLM should consider reclamation obligations in the PEIS and ensure they are being fully implemented.

A fundamental goal of the BLM’s reclamation enforcement actions should be to meet the environmental protection performance standards specified in SMCRA. 30 U.S.C. §1265. In particular, there is a need to ensure that reclamation activities on coal mines on BLM lands “restore the land . . . to a condition capable of supporting the uses which it was capable of supporting prior to any mining, or higher or better uses of which there is a reasonable likelihood . . .” *Id.* § 1265(b)(2). The BLM’s coal mining regulations also establish many environmental protection standards that should be fully met. *See, e.g.*, 43 C.F.R. § 3420.1-4(e)(3) (requiring areas considered acceptable for further consideration of leasing to be screened for compliance with multiple-use needs with “particular emphasis” given to protecting a number of specified resources). The PEIS should ensure there is protection for these environmental features and values by ensuring adequate reclamation standards and requirements are in place prior to leasing.

Finally, as discussed above, the BLM should not allow reclamation obligations to be met through self-bonding on federal lands and mineral estate.

Recommendations: Achieving successful, contemporaneous reclamation of lands disturbed by coal mining is a central feature of SMCRA and it should therefore be central to the analysis in the PEIS. The MLA and the BLM’s coal mining regulations also call for ensuring successful reclamation. The PEIS should therefore ensure that strong reclamation requirements are in place for the federal coal mining program, by rulemaking if necessary. The BLM should seek to meet a goal of restoring the land to the condition it was in prior to mining. As mentioned in the recommendation above, the BLM should prohibit self-bonding as a means to meet coal mining reclamation obligations on the federal mineral estate.

IV. HOW, WHEN, AND WHERE TO LEASE

A. Introduction.

S.O. 3338 committed to addressing the question of “how, when, and where to lease” in the PEIS and identified issues to consider such as the current approach to leasing in response to industry applications, whether lease sales should be scheduled, and whether zoning, as BLM incorporated into the Solar Energy PEIS, should direct where to lease. BLM’s Notice of Intent reiterated this commitment and also referenced the need to focus on the “unsuitability” criteria when determining where to lease. 81 Fed. Reg. at 17,725.

In deciding how, when and where to lease, BLM decision-making should:

- Ensure that the screening criteria outlined in its regulations are fully applied when the BLM evaluates whether areas might be “acceptable for further consideration for leasing” as part of its development of resource management plans (RMP); these criteria can also be applied at the leasing stage to address current conditions and new information.
- Ensure the BLM’s unsuitability criteria are fully applied at the leasing stage.
- Provide protections for lands with wilderness characteristics and Greater sage-grouse.

- Prepare a reasonably foreseeable development analysis of coal resources.
- Establish a regional leasing program that incorporates landscape level planning and more active BLM management, looking at examples such as the Solar PEIS and master leasing plans.
- Comply with NEPA and mitigation obligations to protect other resources and address other impacts, such as contributions to and effects of climate change.
- Address new and existing leases.
- Ensure that, in fulfilling these recommendations, the statutory and regulatory requirements that there will be “maximum economic recovery” from coal leasing and development need to be understood properly in the multiple-use context.

**B. Screening to Determine Tracts “Acceptable for Further Consideration for Leasing”:
Using a Landscape-Scale Approach to Avoiding Impacts.**

Under BLM’s coal mining regulations, coal cannot be leased competitively until it has been evaluated in a comprehensive land use plan or land use analysis. 43 C.F.R. § 3420.1-4(a). This analysis must be conducted pursuant to BLM’s planning regulations at 43 C.F.R. Part 1600, which requires development of an EIS to support the RMP. *Id.* § 3420.1-4(b)(1). In making the “major land use planning decision” concerning the coal resource resulting from this planning, which is “the identification of areas acceptable for further consideration for leasing,” four screening procedures that must be complied with are specified. *Id.* § 3420.1-4(e). The four screening criteria are:

1. Only areas that have “development potential” can be deemed acceptable for further consideration for leasing.
2. The BLM must assess whether the areas being considered for possible leasing are unsuitable for all or certain stipulated methods of mining, as provided for in the BLM’s unsuitability regulations. 43 C.F.R. Part 3460.
3. After application of the unsuitability criteria the BLM is to make further multiple-use decisions which “may eliminate additional coal deposits from further consideration for leasing” so as to protect other resource values and uses that are important or unique but not included in the unsuitability criteria. These multiple use considerations include those specified in section 522(a)(3) of SMCRA and the OSMRE regulations at 30 C.F.R. § 762.5. “[P]articular emphasis” is to be placed on protecting air and water quality, wetlands, riparian areas, and sole source aquifers, as well as Federal lands in the following systems: National Park System, National Wildlife Refuge System, National System of Trails, and the National Wild and Scenic River System.
4. In preparing the land use plan analysis, the BLM is to consult with surface owners who meet certain criteria “to determine preference for or against mining by other than underground mining techniques.”

43 C.F.R. §§ 3420.1-4(e)(1) to (e)(4).

Unfortunately, in the past the BLM often has not fully applied these screens in its land use planning process. The unsuitability criteria are often not applied—or final decisions on unsuitability is deferred—until later in the coal development process when leasing is actually

occurring or mine plans are being developed. Because of this approach, the further multiple-use considerations are also not fully applied during land use planning, even though this is the stage where land use allocations on the basis of the BLM's multiple use and sustained yield mandate are made. Clearly these additional considerations are an important means to ensure the environment is protected from coal development.

Further, making decisions at the land use plan level permits the BLM to make decisions in the context of a larger landscape, where the unsuitability criteria and multiple use considerations will more clearly apply to identify areas that should be protected from coal leasing. As prescribed in FLPMA, when creating land use plans BLM should:

- “consider present and potential uses of the public lands”;
- “consider the relative scarcity of the values involved and the availability of alternative means (including recycling) and sites for realization of those values”;
- “weigh long-term benefits to the public against short-term benefits.”

43 U.S.C. § 1712(c). These provisions supplement and bolster the provisions in the four screening criteria.

Waiting until the leasing stage to determine whether lands are actually better managed as unavailable for coal mining prevents the BLM from seeing the broader context of its decisions and the needs of the other resources in the planning area.

These oversight and analysis problems should be corrected at the RMP level. The BLM should update its land use planning practices to ensure that “acceptable for further consideration for leasing” decisions are fully informed by all of the relevant considerations, as envisioned by FLPMA and the coal regulations.

The BLM should adopt a new policy that would require the BLM to complete and document all 4 steps of the screening process as part of the land use planning process. Emphasis should be placed on ensuring there is full consideration of the specified multiple-use values rather than defaulting to leaving the vast majority of areas available for coal leasing. There is also a need for full compliance with and application of the unsuitability criteria at the land use planning stage. The new policy could also note the types of “land uses” to be protected by application of the multiple-use principles, including preference for renewable energy development and other uses that would have the effect of reducing the climate change contribution of coal from the federal lands.

For plans that were completed without making these determinations, the BLM would ensure that a more rigorous application of the criteria would be made prior to new leasing and commit to a schedule for updating those determinations and plans. For areas that currently have ongoing coal leasing and development, BLM should complete these updated analyses and amendments as part of the PEIS. We recommend the BLM address needed updates to the following RMPs in the PEIS:

- Miles City RMP, Montana,
- Buffalo RMP, Wyoming,

- Bighorn Basin RMP, Wyoming
- Kanab RMP, Utah,
- Uncompahgre RMP, Colorado (a Draft RMP was recently issued without a sufficient analysis; a supplement could efficiently incorporate appropriate analyses and updated decisions into the range of alternatives).

Recommendations: The PEIS should reiterate and require that when the BLM makes the “acceptable for further consideration for leasing” determination in its land use plans that it fully applies the four specified screening factors specified in its regulations *at the planning stage*, although additional information can certainly be considered at the time of leasing. In particular, the unsuitability criteria and consideration of additional multiple use values which “may eliminate additional coal deposits from further consideration for leasing” and which should be given “particular emphasis” should be fully applied at the planning stage such that the agency does not continue to default to keeping all lands available for coal leasing. As part of this planning, the BLM should also emphasize the potential impacts from precluding development of renewable sources of energy on the federal estate, which could assist in our transition away from fossil fuels. The PEIS should ensure that new leasing does not occur without further evaluation of the unsuitability criteria and multiple use considerations. Further, the PEIS should update the decisions in priority RMPs where ongoing leasing and development are most likely to address potential conflicts, as set out above.

C. Application of the Unsuitability Criteria Should Be Emphasized; Unsuitability Criteria Should Be Expanded.

One of the most significant environmental protections that applies to the federal coal program are the provisions for designating areas unsuitable for surface coal mining. These provisions are found in SMCRA. 30 U.S.C. § 1272. The BLM regulations also provide for designating federal lands as unsuitable for surface coal mining. 43 C.F.R. Subpart 3461.

Currently there are 20 criteria listed in the regulations that define areas as unsuitable for surface mining. 43 C.F.R. §§ 3461.5(a)(1) to (t)(1). In the PEIS the BLM should carefully review these criteria and determine whether new criteria should be added to the regulations. It seems apparent the current regulations are not comprehensive enough—there are many conditions that should make an area unsuitable for surface mining that are not recognized in the current regulations. For example, areas with important bat roosts and colonies should probably be made unsuitable. Important Greater sage-grouse habitats—priority habitat management areas (PHMA) and sagebrush focal areas (SFA)—should clearly be made unsuitable for coal mining. This change will likely also require amendments to the recent land use plan revisions the BLM put in to place for sage-grouse conservation, and this issue will be discussed further below.⁶ And perhaps most importantly, the BLM should consider designating areas unsuitable for surface mining where the coal mining would have significant climate change impacts. In particular, if an area can serve as important carbon sink it should not be available for coal mining. There are likely many other additions to the unsuitability criteria that should be made in the PEIS and related rulemaking.

⁶ See <http://www.blm.gov/wo/st/en/prog/more/sagegrouse.html> (presenting the BLM sage-grouse RMP revisions and amendments).

Under the BLM’s regulations, application of the unsuitability criteria and designation of areas that are unsuitable for surface coal mining is to take place at the land use planning stage. 43 C.F.R. §§ 3420.1-4(e)(2), 3461.0-6, 3461.3-1(b)(1) to (b)(2). Unfortunately, however, the BLM has not made decisions based on the unsuitability criteria at the planning stage. All too often the BLM defers application of these criteria when it develops an RMP. In the sage-grouse RMP revisions, for example, the BLM confirmed that priority habitat was “essential habitat for maintaining GRSG for purposes of the suitability criteria set forth at 43 CFR, Part 3461.5(o)(1)” but did not close any lands to future leasing. Rather, the plans state that “[a]t the time an application for a new coal lease or lease modification is submitted to the BLM, the BLM will determine whether the lease application area is “unsuitable” for all or certain coal mining methods pursuant to 43 CFR, Part 3461.5.” *See, e.g., Northwest Colorado Greater Sage-Grouse Approved RMP Amendment, p. 2-18.*

BLM has claimed that it delays unsuitability decisions because there is inadequate data allowing application of a criterion or an exception to it, and, as a result, will instead use “deferred criteria” that will not be applied until later in the coal development process. *See* 43 C.F.R. § 3461.2-1(b)(1). The BLM should carefully review how the unsuitability criteria have been applied to date and make improvements in this process so that the unsuitability criteria are fully and faithfully applied at the land use planning stage. Designating areas as unsuitable for coal mining is an important provision in section 522 of SMCRA as well as in the BLM’s coal regulations. These provisions should not be given short-shrift.

In addition to carefully considering how the 20 unsuitability criteria have been—or have not been—applied, and whether new unsuitability criteria are needed, the PEIS should also carefully review the exceptions and exemptions that are specified in the regulations for each of the criteria. The BLM should ensure that these “escapes” from the unsuitability criteria are fully justified and warranted, and applied in a fair and rigorous manner, which likely requires narrowing the type and application of exceptions.

Recommendations: Meeting the existing unsuitability criteria specified in the BLM’s regulations so as to determine areas that should not be available for coal mining is one of the most important environmental protection mechanisms that is available to the BLM. BLM’s regulations call for the application of these criteria when RMPs are developed. Unfortunately, however, the BLM has all too often deferred application of the unsuitability criteria at the planning stage. The PEIS should direct that the unsuitability criteria must be faithfully, and fully, applied when the BLM develops an RMP. Loopholes in the unsuitability criteria should also be scrutinized and narrowed as appropriate. In addition, the BLM should also consider whether the existing criteria are sufficient and develop new criteria as needed, such as to deal with climate change issues.

D. Lands with Wilderness Characteristics Should Be Addressed in the PEIS.

Lands with wilderness characteristics (LWC) have become increasingly prominent in BLM planning and decision-making, and are also likely to be destroyed where coal leasing is permitted. By definition, these lands have wilderness values of size, naturalness, and outstanding opportunities for solitude or primitive and unconfined recreation. In addition, they may also possess supplemental environmental values such as important historic sites or important wildlife

habitats. BLM's guidance requires the agency to maintain a current inventory of LWC and consider opportunities to protect and/or avoid harm to LWC in both land use planning and implementation decisions. See Instruction Memorandum No. 2011-154 and BLM Manual Sections 6310 and 6320.

Recommendations: The PEIS should fully consider LWCs and the potential impact of the federal coal program on these lands, including requiring updated inventory and evaluation of opportunities for protection of LWC prior to leasing. The important values of lands with wilderness characteristics are generally not present on other lands. The BLM should ensure the federal coal mining program seeks to protect these values.

E. Greater Sage-Grouse Should Be Addressed in the PEIS.

Ensuring sufficient protections for the Greater sage-grouse is a national priority of the BLM that culminated in revisions and amendments to land use plans in 10 states that are intended to conserve habitat and avoid the need to list the species. Many of the affected states, such as Montana, Wyoming, Colorado and Utah, also have significant federal coal deposits. Clearly sage-grouse protection should be an important consideration in the PEIS.

Under the current sage-grouse RMP provisions, the BLM is seeking to minimize new or additional surface disturbance by putting in place caps on development, minimizing surface occupancy from energy development, and identifying buffer distances around leks in important sage-grouse habitats. Unfortunately, however, these planning decisions did not actually close areas to coal leasing. This is a shortcoming that the PEIS should address and seek to correct.

Under the new sage-grouse RMPs, the most stringent protections are provided in PHMA and SFA. The PEIS should seek to ensure there are strong protections when a coal lease is located in a PHMA or SFA. If current protections relative to coal are not at least equivalent to what would be required if oil and natural gas development were proposed, that should be corrected. And finally, as mentioned above, new unsuitability criteria should be developed that would designate PHMA and SFA as unsuitable for surface coal mining.

Recommendations: The BLM through the PEIS, and any needed RMP amendments or revisions, should ensure sage-grouse are sufficiently protected through protections for PHMA and SFA, including making appropriate unsuitability determinations to close areas to leasing.

F. Environmental Protections Can and Must Be Applied to Existing Leases.

In addition to assuring that there are strong environmental protections for lands that might be deemed acceptable for further consideration of leasing, the BLM must also ensure that there are strong environmental protections applied to existing leases. There is a need to ensure that protections are in place for renewals of existing leases, for expansions of existing mines, lease exchanges, lease transfers, and for lease modifications. Both mitigation measures and other environmental protections must be applied to existing leases.

There are number of sources of authority that allow the BLM to ensure existing leases are managed to protect the environment. Prior to conducting operations that could disturb the environment, a lease holder must submit an operation plan and a reclamation plan. 30 USC 207(c). There is no reason these plans should not be subject to periodic review. The BLM is charged to “oversee exploration, development, production, resource recovery and protection, diligent development, continued operation, preparation, handling, product verification, and abandonment operations” 43 CFR 3480.0-6(d). This is a continuing obligation. This applies to exploration plans, resource recovery and protection plans, and other activities. *Id.* at 3480.0-6(d)(1)-(2). Compliance is to be assured by ensuring compliance with all applicable laws, regulations, and lease terms, and “approved exploration or resource recovery and protection plans” *Id.* 3480.0-6(d)(5).

In addition, the BLM’s standard coal mining lease provides that lessees must have “due regard” for the prevention of “waste, damage or degradation to any land, air, water, cultural, biological, visual, and other resources,” among other things. BLM Form 3400-12 § 7. “Lessees must take measures deemed necessary by lessor to accomplish the intent of this lease term.” *Id.* Prior to the termination of bond liability, and at other times, lessees must “reclaim all lands the surface of which has been disturbed” *Id.* §10. Leases are made subject to the terms of the Clean Water Act and the Clean Air Act, as well as SMCRA. *Id.* §14. A number of additional special environmental protection stipulations are attached to many coal leases. Lease terms are subject to readjustment on specified terms. 43 C.F.R. 3451.1(a)(1).

Recommendations: BLM has ample authority to apply needed mitigation measures and other environmental protections on existing leases, not only at the time of renewal, modification or transfer, but also for ongoing approvals of development. BLM can also provide for shorter readjustment periods than those in the current regulations, and should initiate any required rulemaking.

G. The BLM should look to its Solar PEIS and Oil and Gas Master Leasing Plan policy as Models for Landscape-scale Guided Development and Avoidance that could be Incorporated into the Coal PEIS.

In updating its approach to managing leasing of federal coal resources, BLM can look to recent programmatic and policy decisions for managing development of federal solar and oil and gas resources. Both the Solar PEIS and the agency’s Master Leasing Plan (MLP) policy provide methods for proactively managing leasing to reduce conflicts, protect other values, and guide development to the right places.

1. The Solar PEIS.

The Solar PEIS provided a framework for solar energy development that updated the BLM’s existing approach, which simply responded to applications submitted by developers for rights-of-way. The Solar PEIS ultimately made a number of decisions that can and should be considered for updating the agency’s approach to leasing in the Coal PEIS, including:

- Identifying Solar Energy **Zones** (SEZ) that are “relatively large areas that provide highly suitable locations for utility-scale solar development: locations where solar development is economically and technically feasible, where there is good potential for connecting new electricity-generating plants to the transmission distribution system, and where there is generally low resource conflict.” Solar Final PEIS, pp. ES-7 – ES-11. Similarly, the Coal PEIS could identify areas that are “highly suitable” for coal in terms of having high resource potential and low resource conflicts, while also being economically and technically feasible.
- Identifying **exclusion areas** from solar development, which “allows the BLM to support the highest and best use of public lands by avoiding potential resource conflicts and reserving for other uses public lands that are not well suited for utility-scale solar energy development.” Solar Final PEIS, p. ES-7. These areas are significant because of “the size and scale of utility-scale solar energy development (typically involving a single use of public lands).” *Id.* Instead of leaving the vast majority of lands open to coal leasing, the BLM can and should identify categories of lands that should be excluded, especially since coal mining also limits the use of land to a single use.
- Identifying **variance lands** that could be made available subject to a stringent process and showing of need in case the SEZs are “insufficient to accommodate demand.” Solar Final PEIS, p. ES-14.
- Incorporating **programmatic design features** that would be incorporated into all future development in order “to avoid or reduce adverse impacts.” Solar Final PEIS, p. ES-6. Similarly, incorporating mandatory best practices for coal development could reduce environmental impacts.
- Setting out a **mitigation framework** and incorporating the mitigation hierarchy of avoidance, minimization and offset/compensation and preparation of regional mitigation strategies through the following actions:
 - “Avoidance will be achieved through siting decisions and the identification of priority SEZs.”
 - “Minimization will be achieved through the application of design features and adherence to applicable federal, state, and local laws and regulations such as the Endangered Species Act (ESA).”
 - “For those impacts that cannot be avoided or minimized, the BLM will determine, in consultation with affected stakeholders, if measures to offset or mitigate adverse impacts would be appropriate.”
 - “BLM proposes to establish regional mitigation plans that will facilitate development in SEZs. As envisioned, these regional mitigation plans will simplify and improve the mitigation process for future projects in SEZs.”
 Solar Final PEIS, p. ES-6. Mitigation should similarly be incorporated into the Coal PEIS, including a regional mitigation strategy to evaluate and design needed mitigation at the programmatic level.

2. Master Leasing Plans.

Master Leasing Plans are created at a smaller landscape level to manage oil and gas development, focusing on areas where there are likely impacts to and potential conflicts with

other resources. *See*, Handbook H-1624-1 (Planning for Fluid Mineral Resources), Chapter V. MLPs incorporate a number of tools to reduce conflicts and guide development to appropriate areas that could be incorporated into the Coal PEIS, including:

- Identifies **resource condition objectives** to provide standards for subsequent development and reclamation; these may apply to management for air quality, wildlife habitat, riparian areas. H-1624-1.V.C.1. Setting standards prior to approving coal leasing and development will enable BLM to identify and address potential impacts.
- Incorporates **resource protection measures** to reduce environmental impacts and help achieve resource condition objectives. These measures may include closing areas to leasing, phased leasing, or other lease stipulations or conditions of approval restricting the timing, location, or method of operations; or conditions of approval. H-1624-1.V.C.2. In practice, these measures have included prioritizing mineral leasing in areas with high development potential and minimal resource conflicts, and using phased leasing and development, which can be accomplished through identifying areas to be leased in order and by using limitations on the amount of cumulative surface disturbance that can occur and requiring reclamation prior to additional development. These types of approaches could be used as part of managing both leasing and development in the Coal PEIS.
- Extends to **BLM surface and split estate** lands. *See*, Instruction Memorandum 2010-117. The Coal PEIS can and should address leasing and development of federal coal resources including where BLM may not manage the surface.
- Extends to both **new and existing leases**. H-1624-1.V.C.2. The Coal PEIS can and should incorporate protective measures, including mitigation, which will apply to new leases and approvals of development on existing leases.

Most of these key concepts are embedded in coal regulations and policy already, including the unsuitability criteria, multiple use considerations, special stipulations for leases, and “due regard” language in standard lease terms and the regional leasing framework.

Recommendations: The BLM should evaluate the key elements discussed above from the Solar PEIS and MLP policy and incorporate them into a proactive approach to managing where, when and how leases are issued and developed. Protective management conditions can be incorporated into new leases via special stipulations and into existing leases through the mechanisms discussed above. BLM has the overarching authority to put similar measures into place to identify the best places for development; protect places that are not suitable for development; and manage development by controlling when, where and how leasing and development occur through tool like phased leasing, phased development, and required best practices.

H. The BLM Must Take Control of the Federal Coal Leasing Program to Obtain a Fair Return.

BLM needs to take a more proactive role in managing leasing and development of coal resources on public lands to ensure that the coal program achieves the goals laid out in S.O. 3338 and underlying statutory authority, including ensuring a fair return to taxpayers, best meeting

national energy needs, achieving U.S. carbon emission reduction goals, and improving protection and management of the many values of our public lands.

The agency should use its broad authority to take control of the Federal Coal Leasing Program through an updated regional coal leasing process to better plan for and manage the leasing and development of publicly-owned coal resources.

1. The current leasing approach has widely-known deficiencies.

The Department of the Interior has broad discretionary authority to decide where, when, and under what terms and conditions, coal development should occur. Under existing regulations, the Secretary can set leasing levels and determine potential coal leasing tracts based upon regional land use planning, expected demand for coal resources, and potential environmental and economic impacts that could result from leasing. 43 C.F.R. § 3420.2.

Yet since 1990, all federal coal leasing has been conducted through a lease-by-application process where coal companies propose tracts of land they are interested in developing to be leased by BLM. In most cases, the lease tracts applications are adjacent to companies' existing coal mines. These take the form of either a lease modification which are non-competitive modifications of existing leases to add contiguous lands of as much as 160 acres or Lease by Application (LBA) for specific tracts delineated by the applicant. More than 90 percent of the lease applications the BLM has received have been for these "maintenance tracts" used to extend the life of an existing mine or to expand that mine's annual production. And in all but one case over the last 25 years, the company that applied for a lease was the only—and the successful—bidder for the tract. This approach makes setting a fair price for the leases very difficult and allows coal companies to set the timing, location, and size of leases.

The consequences of letting industry set the pace, scale and location of lease sales have been well documented. Numerous independent audits and third party reviews from 1980 to 2014 have found that the program does not provide a fair return to taxpayers, concluding that "There is no evidence that the BLM receives a market price for the coal,"⁷ "weaknesses in the current sale process . . . could put the Government at risk of not receiving the full value for the leases,"⁸ and the BLM "does not obtain fair market value for taxpayers. It seldom generates competitive bids, and studies indicate that the resulting losses are substantial."⁹

BLM does not adequately limit lands open to development to appropriate lands. As we outlined in Section IV. B., BLM does not fully consider the full range of multiple-use values during land use planning. An example of this problem in practice is the Buffalo RMP under which "All coal lands are open to exploration, subject to multiple use constraints, resulting in zero acres closed to coal exploration and 4,775,136 acres open to coal leasing. . . ."¹⁰

⁷ Institute for Energy Economics and Financial Analysis, "The Great Giveaway: An analysis of the costly failure of federal coal leasing in the Powder River Basin," June 2012.

⁸ U.S. Department of the Interior Inspector General's Report, "Coal Management Program, U.S. Department of the Interior," June 2013.

⁹ Taxpayers for Common Sense, "Federal Coal Leasing: Fair Market Value and a Fair Return for the American Taxpayer," September 2013.

¹⁰ Buffalo Resource Management Plan Final Environmental Impact Statement, 2015, p. 123.

To address these problems, BLM should consider replacing the existing LBA leasing system with a modern approach that creates mechanisms to ensure a fair return, ensures any new leasing is based on a full consideration of other resources, and provides BLM with tools to achieve national policy priorities such as combating climate change.

2. BLM has authority to manage leasing differently.

As we have emphasized repeatedly in these comments, the BLM has wide latitude to craft the requirements that apply to the federal coal leasing and development program. The Secretary of the Interior has complete discretion to issue leases, which must meet the “public interests.” 30 U.S.C. § 201(a)(1). Besides provision for rentals, royalties, and a limitation on the lease term to 20 years, subject to production requirements, “[t]he lease shall include such other terms and conditions as the Secretary shall determine.” *Id.* § 207(a). Using this broad authority, the BLM has put in place the federal coal mining regulations at 43 C.F.R. Part 3400 which govern all facets of federal coal mining, including: exploration; competitive lease sales; LBAs; split estate leasing; non-competitive lease sales; lease modifications; mining licenses; coal lease management; environmental protection; lease qualification requirements; provisions for fees, rentals, and royalties; lease terms, etc. These regulations were generally put in place in 1979 with some later revisions under the authority provided by the MLA, Mineral Leasing Act for Acquired Lands of 1947, FLPMA, SMCRA, and other statutes. *See* 44 Fed. Reg. 42584 (July 19, 1979) (stating these statutes formed the basis for the BLM’s coal regulations, which were finalized in this rulemaking). *See also* 43 C.F.R. § 3400.0-3. Given the sweeping scope of the agency’s statutory authority and current regulations, BLM can make needed revisions and put in place new regulations to improve fair return, reduce climate emissions, and better protect affected lands and resources.

3. BLM should develop a new, multi-year approach for coal leasing and development.

BLM should use the PEIS to develop a new, multi-year approach for the leasing and development of federal coal in the West. This will likely require some new regulations but can be developed and subjected to NEPA analysis in the PEIS. Under a new approach, BLM would initiate new leasing activity based on market circumstances, progress on climate objectives and other considerations; determine where coal leases will be considered and screen for potential conflicts; develop new methods for selling coal resources in collaboration with the industry and leading economic experts; enhance the assurances that potential lessees have the financial and technical capabilities to viably operate the lease in question for its anticipated duration; and issue leases for specific tracts.

a. *Establish a Western Coal Production Region.*

In order to create a unified approach to coal leasing and to allow the BLM to manage the amount and timing of coal lease sales, the BLM should create a Western Coal Production Region based on the region as defined by the Energy Information Administration (EIA). EIA defines the Western coal region to include Alaska, Arizona, Colorado, Montana, New Mexico, North Dakota, Utah, Washington, and Wyoming.¹¹ According to the latest state-specific data from

¹¹ *See* U.S. Energy Information Administration, <http://www.eia.gov/tools/glossary/?id=coal>.

EIA's *Annual Coal Report*, of the coal produced in the United States in 2014, 54 percent was produced in the Western coal region, with Wyoming producing the lion's share: 73% of the coal mined in the Western coal region.¹² This region also encompasses 94 percent of the leases BLM had on record in 2015.¹³

Given significant differences in the geology, coal rank and quality, and mining conditions within the Western Coal Production Region, the BLM could consider special circumstances faced by mine-mouth power plant situations, where coal rank and value may be low, but the lack of transportation costs creates unique captive markets. Any exception process for mine-mouth plant situations would have to consider the climate change implications of extending leasing and operations of the plant and the socio-economic dislocations associated with continuing or restricting coal availability for the local community (as discussed in Section VIII).

For coal resources outside the western region, BLM should consider whether to create an eastern coal leasing region and apply new leasing approaches to those areas as well.

b. Prioritize where coal leases will be considered.

As described in Section IV.B., BLM should determine where additional leasing should be given "particular emphasis" and "eliminate additional coal deposits from further consideration for leasing" within RMPs, or for areas where such determinations have not been made, as part of the 5-year plans. Within the Western Coal Production Region, BLM should prioritize revising land use plans in areas where there are active coal mines.

c. Specify the size and timing of potential leasing activity.

The BLM should significantly modify the orientation of the agency to the industry in reforming the federal coal program. As the dramatic, rapid changes in the coal industry over the past two years have shown, federal lands deserve a more objective arbiter of whether, where and when additional coal resources should be put on the block for development. To accomplish this, the BLM should assume a greater role in specifying the size and timing of potential leasing activity that the Secretary of the Interior determines will best meet national energy needs, achieve U.S. carbon emission reduction goals, and ensure a fair return to taxpayers.

Under this approach, BLM would set the total amount of coal resource available for sale by auction each year consistent with a 5-year plan. There is precedent within BLM and elsewhere with the Interior Department for such a program: the Bureau of Ocean Energy Management (BOEM) has a Five-Year Program for oil and gas development. It establishes a schedule of oil and gas lease sales proposed for planning areas of the U.S. Outer Continental Shelf (OCS). The Program specifies the size, timing, and location of potential leasing activity that the Secretary of the Interior determines will best meet national energy needs. BOEM also has a leasing program

¹² See Table 1 in U.S. Energy Information Administration, *Annual Coal Report 2014*, March 2016. Available at <http://www.eia.gov/coal/annual/pdf/acr.pdf>. (Accessed July 26, 2016.)

¹³ Cross Reference of BLM Coal Lease Serial Numbers and MSHA Identification Numbers, Feb. 3, 2015. BLM FOIA# 2015-00462. Mark Haggerty, Headwaters Economics, pers. comm.

for its off-shore renewable energy that incorporates a multi-phase leasing process. We recommend the BLM seriously consider the five-year planning process for use in determining how much and which coal resources should be made available on a shorter time horizon than afforded by the PEIS.

In these five year plans, the BLM could set production targets for the total amount of coal resource sales that would be needed to meet declining coal production demand from public lands. The BLM should also consider carbon performance for coal's allocated share of all federal lands energy under a "carbon budget" calibrated to leading domestic and international climate goals. Our views on the need for a carbon budget are discussed in section VI.E. of these comments.

d. An Immodest Proposal: Auction coal resource allocations (credits) within the Western Coal Production Region.

To overcome the problems related to assuring a fair return for coal in a declining market dominated by incumbent mines leasing coal adjacent to their existing mines, BLM should develop an alternative bidding program for allocating federal coal in the Western Coal Production Region. BOEM has studied different auction systems for issuing renewable energy leases, easements, and rights-of-way on the OCS that may provide models for BLM to look at as it modernizes its coal leasing program.¹⁴

One approach to selling coal rights would have BLM auction coal resource allocations (or lease credits) rather than specific tracts for lease. BLM could specify the amount of coal made available for lease in terms of a total British thermal units (Btu) value, to establish basic parity among different areas within the leasing region. Because the quality of coal resource varies tremendously from one location to another, using a more static unit of measurement such as acres of land or tons of coal as the limit on the amount available for lease would disproportionately affect and disadvantage mines or companies producing lower quality coal. Btu content measures the heating value of the resource and therefore reflects the need for a larger amount of acreage or tons of coal to be developed to reach that limit in poorer quality areas. Additionally, leasing based on total Btu allows the BLM to easily track and measure potential GHG emissions from approved leases and compare that to the agency's climate targets or goals under the carbon budget discussed in section VI.E.

During this phase of the program, the sale of coal resource allocations (or lease credits) gives the successful bidder the right to subsequently seek BLM approval for the development of a leasehold. The lease credit does not grant the holder the right to construct any facilities; rather, the lease credit grants the right to develop a lease application and plan of development, which must be approved by BLM before the project can move on to the next stage of the process.

¹⁴ BOEM issued a contract to Power Auctions, LLC to study different types of auctions for wind rights. The study has been published in three parts, and is available at the links below:

- [Auction Design for Wind Rights](#)
- [Multiple Factor Auction Design for Wind Rights](#)
- [Comparison of Auction Formats for Auctioning Wind Rights](#)

A coal resource allocation auction system would help to convey coal resource allocations (credits) to entities most likely to successfully develop the resources and to meet the statutory requirement to obtain a fair return on coal sales. It could also provide a mechanism for reducing the carbon consequences of the federal coal program by putting BLM in charge of the pace and scale of coal allocation sales.

BLM should develop new auction formats to implement the new program and address important program performance goals. Performance measures developed by BOEM for its auction process for Wind Energy Areas¹⁵ could be applied to BLM's approach:

- Economic Efficiency: The auction process should try to ensure that future federal coal sales are awarded to those who value the coal resource the most because these entities would likely be the most efficient at using the resource;
- Fair Return: BLM is statutorily required to obtain a "fair return" for coal resources.
- Program Efficiency: The coal auction process must be manageable for BLM to administer;
- Lease Boundary Flexibility: Within constraints fixed by BLM, the auction should allow bidders to apply coal allocations to the optimal lease areas;
- Competition: The auction process must be fair, and encourage participation from all interested bidders while minimizing the opportunity for collusion among bidders;
- Transparency: The auction process must be an open one in which bids are comparable and the reason why the winners won is clear;
- Neutrality: The auction process must ensure that all bidders are treated equally;
- Simplicity: The auction process must be easily understood and implemented, for both the bidders and BLM; and
- Consistency: The auction process should be applicable to the issuance of leases in a variety of contexts.

e. Issuing specific leases to exercise coal credits.

Once sold, the credits could then be applied to specific lease tracts in the Western Coal Production Area identified by the successful bidders from within lands made available to leasing by the BLM. Though the selection of tracts would look similar to what those companies would propose under the lease by application system, allocations would have to be within areas pre-screened by BLM and BLM would not have to determine the fair market value at this stage—it will have been determined at the auction stage. BLM would still have to determine the Btus contained within a specific tract, but the agency could do that in a public and transparent way since there would not be bidding on the specific lease tract.

Under this, or any leasing system, BLM must continue to ensure full NEPA compliance by preparing an EIS for coal leases, which is also envisioned by the current regulations. *See* 43 C.F.R. § 3420.3-4(c) (stating that "[a]fter tract ranking and selection, a regional lease sale environmental impact statement . . . shall be prepared" by the BLM in accordance with NEPA). These EISs would consider the site-specific impacts at each tract and the regional cumulative

¹⁵ <http://www.boem.gov/Renewable-Energy-Program/Regulatory-Information/RenewableEnergy-Auction-Formats.aspx>

environmental impacts of the proposed lease, including other coal and non-coal development activities. 43 C.F.R. § 3420.3-4(c)(1) to (c)(2). It would be important to maintain this NEPA compliance both so that environmental issues can be dealt with and so that the public can be fully engaged.

Finally, the BLM should abandon the use of Regional Coal Teams and instead determine regional leasing needs based on expert analysis.

Recommendations: The BLM should carefully analyze the current coal leasing system in the PEIS and develop new regulations to modernize the process, incorporating elements from the Solar PEIS and oil and gas Master Leasing Plans discussed above. The agency should terminate the LBA leasing system and replace it with a Western Regional Coal Leasing Program that incorporates some of the principles from the current regulations but is updated to reflect current knowledge and policy. This regional system should evaluate bidding on individual tracts with bidding on an amount of coal that the BLM has determined should be available for development. This leasing system should be consistent with the carbon budget recommendations we make elsewhere in these comments. This new system could be put in place based on five-year plans of development similar to the system used in Outer Continental Shelf oil and gas leasing. These plans of development should be designed to meet national program objectives and done from a Western Regional perspective, not a local one. The BLM should also abandon the use of Regional Coal Teams and instead determine regional leasing needs based on the BLM's expert analysis. The provisions for NEPA compliance should be maintained in the regional coal leasing program. In all cases this leasing system must ensure the federal government achieves a fair market value for the federal coal it leases.

I. BLM Should Prepare a Reasonably Foreseeable Development Scenario.

An important issue that BLM must address in the PEIS is the Reasonably Foreseeable Development (RFD) level for federal coal that is likely in the next several decades. RFD is a term that is routinely used when the BLM considers oil and gas development activities, but is also used in other contexts, including for coal and as part of the Solar PEIS. As mentioned in section I above, where we discussed scoping issues, the BLM's NEPA Handbook says that in scoping the BLM should identify "reasonably foreseeable actions." This is essentially direction that the BLM consider coal RFD in the PEIS.

An RFD is essentially a long-term projection of exploration, development, production, and reclamation. Activity that can inform the development of alternatives, analysis of environmental consequences, and selection of a management approach are all affected by the RFD analysis. The summary of an RFD in BLM's guidance related to planning for oil and gas development highlights the need for an RFD as part of the Coal PEIS:

A Reasonably Foreseeable Development Scenario:

1. Is based on a reasonable, technical, and scientific estimate of anticipated oil and gas activity based on the best available information and data at the time of the study.
2. Provides the RMP/NEPA process with information needed in the review and

- evaluation of existing management direction and alternatives for a land use plan or plan amendment.
3. Facilitates informed decisions on the management of oil and gas resources balanced with management of other resources.
 4. Provides an effective tool to determine the need to update or revise the NEPA document upon which a management plan is based.
 5. Includes an evaluation of interrelated activity resulting from oil and gas exploration and development efforts regardless of land ownership or jurisdiction.
 6. Provides information necessary for the identification and assessment of alternatives in a NEPA document.
 7. Provides technical information for analyzing cumulative effects from oil and gas activity that could be reasonably expected as a result of a BLM decision.
 8. Is prepared by specialists with technical and scientific oil and gas experience and qualifications (Petroleum Geologists and/or Petroleum Engineers with assistance from experienced Minerals Resource/Natural Resource Specialists as needed).
 9. Is documented in a report subject to peer review.
 10. Will be included in the administrative record of any analysis for which it is used.
 11. Is a technical report that supports NEPA and planning documents that can be challenged through the administrative review process.

Instruction Memorandum No. 2004-89, Attachment 1-3.

NEPA dictates that BLM take a “hard look” at the environmental consequences of a proposed action and the requisite environmental analysis “must be appropriate to the action in question.” *Metcalfe v. Daley*, 214 F.3d 1135, 1151 (9th Cir. 2000); *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 348 (1989). In order to take the “hard look” required by NEPA, BLM is required to assess impacts and effects that include: “ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, *whether direct, indirect, or cumulative.*” 40 C.F.R. § 1508.8. (emphasis added). NEPA regulations define “cumulative impact” as:

the impact on the environment which results from the *incremental impact of the action when added to other past, present, and reasonably foreseeable future actions* regardless of what agency (Federal or non-Federal) or person undertakes such other actions. *Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.*

40 C.F.R. § 1508.7 (emphasis added).

To satisfy NEPA’s hard look requirement, the cumulative impacts assessment must do two things. First, BLM must catalogue the past, present, and reasonably foreseeable projects in the area that might impact the environment. *Muckleshoot Indian Tribe v. U.S. Forest Service*, 177 F.3d 800, 809–10 (9th Cir. 1999). Second, BLM must analyze these impacts in light of the proposed action. *Id.* Therefore, there is no doubt the BLM must consider the likely level of

federal coal development that can be anticipated in the future. Tools and data are available that allow assessments of likely demand levels under different scenarios, so the amount of coal that will be demanded and potentially mined can also be estimated. Knowing how much coal will potentially be demanded and produced from federal coal leases under different scenarios is clearly a fundamental area of information that both the agency and the public should have available if informed decision-making is to occur.

The BLM has developed a forecast of reasonably foreseeable coal, coal-related, and other industrial development (RFD) in the Powder River Basin. As recently as 2011, BLM put out an RFD for the Powder River Basin for use in evaluating cumulative impacts in future NEPA documents as part of the Powder River Basin Coal Review.¹⁶ The RFD summarizes “the past and present energy-related development activities that have occurred in the PRB through the end of 2008 and the projected RFD activities for future years 2020 and 2030.”¹⁷ The BLM should develop an RFD for the entire federal coal program, encompassing all mines and leases for federal coal as part of the PEIS, but it must improve upon the methods used in the Powder River Basin Coal Review.

The Powder River Basin Coal Review RFD inaccurately predicted production levels. The 2011 RFD generated two scenarios—the lower and upper production scenarios, both of which assumed an increase of coal production in both Montana and Wyoming by 2030. Yet since 2011 (and the base year of the study 2008), coal production from the Powder River Basin has declined. The two production scenarios were based on information from 2010 projections of U.S. electricity consumption (IHS Global Insight (2010)), total Powder River Basin annual production projections (Wood McKenzie (2010)), global electricity consumption (International Energy Agency (2010)), U.S. Energy Information Administration (2010) and information provided by Powder River Basin coal mine operators and regulatory agencies. But most importantly the RFD is based on the history of production levels from 1990 to 2009, which “increased at an average rate of approximately 4.5 percent per year.” (Task 2, p. 3-2). And it assumes a robust international export market. (Task 2, p. 2-4). The RFD also assumes that certain speculative projects, including a mine-mouth coal to liquids plant (for example, the Many Stars Project in Montana), coal gasification projects (for example, the School Creek Mine proposal in Wyoming), lease development at the Otter Creek mine in Montana for export, and continued constant production at the Rosebud in Montana will occur. Most of these projects have now been withdrawn or are in the process of being shut down.

The coal industry is changing rapidly and historic production is no longer a good predictor of future production. Business as usual is anything but for the coal industry, and the BLM must analyze the new-normal for the federal coal program and then analyze reasonable future development using more robust data and models.

¹⁶ Powder River Basin Coal Review, Q&A, http://www.blm.gov/wy/st/en/programs/energy/Coal_Resources/PRB_Coal/prbdocs/coalreview/QAs.html, last accessed, 7/15/2016.

¹⁷AECOM, Task 2 Report for the Powder River Basin Coal Review—Past and Present and Reasonably Foreseeable Development Activities, December, 2011, http://www.blm.gov/wy/st/en/programs/energy/Coal_Resources/PRB_Coal/prbdocs/coalreview/task_2_update_12_0.html, last accessed 7/15/2016.

In developing national level RFD projections as part of the PEIS, the BLM must carefully consider assumptions that have been made in RFD analyses and whether they are valid. Given the economic conditions of the coal industry, existing mines may not remain in operation and new mines may not be built. Given the growth in natural gas generated electrical power and regulations such as the Clean Power Plan it might not be wise to assume that new coal-fired power plants will be built, or that existing coal-fired power plants will necessarily continue in operation. The RFD projections in the PEIS should be based on current conditions and those projected to be in place out to about 2050, which is the period of time that must be considered relative to this country's climate change GHG commitments. It is clear the level of federal coal development may well decrease, and the RFD in the PEIS should recognize this possibility and be based on it.

The Powder River Basin RFD Report, like other BLM RFDs, was considered part of a cumulative impacts analysis. Given the significance of the cumulative impacts analysis in the Coal PEIS, the BLM should similarly use an RFD analysis and projections to inform the needed cumulative impacts analysis in the PEIS.

We have also considered two other BLM RMP analyses where RFD for coal was implicated. First, in the Kemmerer RMP in Wyoming, the analysis was largely a technical, geological consideration of coal resources in the area with the coal development potential being considered. Additionally, the BLM applied the four RMP coal leasing screens that have been discussed elsewhere in these comments to identify areas that could be available for leasing. Six small areas were found to be acceptable for further consideration for leasing and one LBA area (the Haystack area) was of primary likelihood for development. In assessing the potential for future development the BLM considered coal sale prices that were evident in the area and EIA development forecasts, and generally concluded that the mine in the Kemmerer area would serve a local market (a local power plant) and that overall growth in the coal market in southwest Wyoming would be slow (0.8-0.9 percent per year).

In southwest Colorado, federal coal in the Paonia/Somerset area were the primary focus in the Uncompahgre Draft RMP. The RMP concluded mineable coal would be available in the area through at least 2022. In the planning area the Somerset coal field had the greatest potential for continuing production and demand for Somerset coal "will remain high and will likely continue to provide around 40 percent of Colorado's coal." The Elk Creek mine in Somerset has gone idle and is essentially closed. Reference is made in the Uncompahgre RMP to the "Coal Resource and Development Potential Report" but this document does not seem to be available on line.

To the extent existing RMPs have not provided RFD analyses for coal, the BLM will need to update those RMPs. It is apparent that the level of coal mining and the demand for coal may well decrease. The RFD in the Coal PEIS should be developed in light of this likelihood, using updated models and with related information provided by the EIA and the U.S. Geological Survey. BLM should develop a revised analysis of past and present coal development activities using updated data, assumptions, and analytical tools to reflect the "new normal" or baseline case

for the coal program. The agency should also develop an RFD for the program, incorporating into its analysis the use of energy models.¹⁸

Recommendations: The BLM should prepare an RFD as part of the Coal PEIS that incorporates sufficient analysis to inform cumulative impact analysis and management decisions. The RFD should follow the elements identified in BLM’s guidance for preparing an RFD for oil and gas development. Further, the RFD analysis in the Coal PEIS must not only provide information on the future coal development potential and the amount of coal that will be mined out to at least 2050, but should also look at estimates of the amount of land that will be disturbed by coal mining and the reclamation needs that will be presented by this level of disturbance. There is a need to know disturbance levels and reclamation needs as part of the RFD assessment. The BLM should also update RFDs in existing RMPs to the extent needed.

J. Maximum Economic Recovery Must Be Assessed in the Context of Multiple-Use Obligations.

There are requirements in the MLA and in BLM’s coal regulations for coal leasing and development to provide for the “maximum economic recovery” (MER) of the coal. However, MER does not dictate all decisions related to the federal coal leasing program. BLM retains significant discretion to decide if, when and where to issue leases, as well as how to regulate development of those leases and royalties or other associated fees.

There are only two points where applicable laws require DOI/BLM to apply the MER standard:

1. Before leasing, when deciding if a lease should be developed by surface or underground mining – using MER to determine the right technical approach. 30 U.S.C. § 201(a)(3)(C).
2. After leasing, when evaluating an operating plan, which must achieve MER in order to be approved. 30 U.S.C. § 201(a)(3)(C).

Further, operators have the responsibility to conduct operations to achieve MER, with the BLM confirming whether MER will be achieved. 43 C.F.R. § 3484.1(b). MER is defined in the BLM coal regulations but it “does not restrict the authority” of the BLM to make decisions providing for the conservation of other resources. *Id.* § 3480.0-5(21). In the definition of MER it is also stated that MER will also provide for “compliance with applicable laws and regulations.” *Id.* Prior to holding a lease sale, the Secretary must solicit public comments on the fair market value of the coal and its MER, and she must consider “factors that may affect these 2 determinations.” *Id.* § 3422.1(a).

While there are requirements to consider achieving MER when coal is leased, this should not be viewed as the sole goal of the federal coal program. Fundamentally coal leasing is a discretionary action on the part of the Secretary that is taken in the “public interests.” 30 U.S.C. § 201(a)(1). The Secretary can also attach terms and conditions of her choosing to a lease. *Id.* § 207(a). Before any actions can be taken on a leasehold that may cause significant disturbance to the

¹⁸ See Howard, Peter, “*The Bureau of Land Management’s Modeling Choice for the Federal Coal Programmatic Review,*” review copy, July 2016.

environment, lessees must submit for Secretarial approval an operations plan and a reclamation plan, and no bid for a lease can be accepted that is less than fair market value. *Id.* § 207(c). 43 C.F.R. § 3422.1(c). And most significantly, the FLPMA puts in place requirements for the BLM to ensure multiple-use management on the public lands, and one part of the definition of multiple-use provides for “consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output.” 43 U.S.C. § 1702(c). Moreover, numerous environmental protection provisions apply to federal coal leases such as the prohibition in FLPMA on taking any action that causes “unnecessary or undue degradation” of the land, and the numerous reclamation provisions of SMCRA and the provisions of the Clean Water Act and Clean Air Act.

Given these other multiple-use requirements, the BLM should not allow MER determinations to trump other important issues in deciding where, when, and how to lease. The MER requirements amended into the Mineral Leasing Act by the Federal Coal Leasing Act Amendments must be viewed as complimentary to the multiple-use requirements specified in FLPMA. The multiple-use definition in FLPMA clearly does not envision assuring MER unilaterally, rather, it envisions consideration of the relative values of the resources.

Recommendation: While the BLM is required to consider MER in the federal coal program, achieving MER should not be treated as a unilateral, unvarying command. It should be achieved in recognition and in compliance with the BLM’s broad multiple-use mission, which is also mandatory.

V. BLM MUST ENSURE THAT THE MITIGATION COMPONENTS OF THE PEIS ARE CONSISTENT WITH FLPMA, NEPA AND CURRENT MITIGATION GUIDANCE

As detailed more fully in Attachment 2, the agency has a broad range of authorities supporting analysis of the full range of impacts and actions to offset unavoidable impacts. FLPMA requires the BLM to manage for multiple use and sustained yield, and to avoid unnecessary or undue degradation of resources and values. *See*, 43 U.S.C. §§ 1701, 1732(b). NEPA and associated CEQ guidelines require the BLM to analyze potential impacts and consider ways to avoid, minimize and mitigate impacts. *See*, 40 C.F.R. §§ 1508.8, 1502.14, 1502.16. More recent guidance requires the BLM to take a landscape-scale approach to planning for conservation and energy development as well as analysis of proposed development and consideration of mitigation. This PEIS is the right vehicle for establishing a landscape-scale approach to coal leasing, exploration and development.

Applicable laws and policies require that the mitigation hierarchy be applied step-wise, starting with avoidance and then minimization, and only after opportunities for avoidance and minimization are exhausted considering compensatory mitigation to offset unavoidable impacts. The landscape-scale approach should also be used at all steps in the hierarchy; at the avoidance stage by focusing development in low-conflict areas and prioritizing conservation in areas with important and sensitive resources and values, at the minimization stage by developing protective measures that address resources on a landscape scale, and at the compensatory mitigation stage through development of Regional Mitigation Strategies or Plans.

Through its approach to mitigation in the Coal PEIS, BLM must ensure that impacts to *all* resources and values from coal leasing, exploration and development are addressed. Though there is a long history of requirements for compensatory mitigation for impacts to wetlands and endangered species, other resources and values have historically been neglected or ignored. Current mitigation guidance underscores the need to address all impacted resources and values, consistent with underlying statutes.

It is important to note that the improved approach to mitigation in recent guidance is not only required under current law and policy, it is also showing benefits in the form of improved outcomes for both energy developers and stakeholders and the public who care deeply about impacts on our public lands. The Dry Lake Solar Energy Zone outside of Las Vegas, Nevada shows the promise of this approach. Because of the landscape-scale approach and upfront analysis the BLM completed through the Solar PEIS and the Solar Regional Mitigation Strategy for the zone, the BLM was able to provide predictability to developers on their mitigation costs and an expectation for an efficient permitting process, drawing \$5.8 million in bids from three winning bidders. The BLM then completed NEPA analysis and permitting for the projects in less than a year, less than half the time for projects outside of zones. Mitigation funds will be spent on strategic restoration and preservation efforts in the region that have garnered the support of local and regional stakeholders. And First Solar will be delivering power from its projects in the zone for \$3.8 cents/kWh, one of the cheapest rates in the nation. Similar efficiencies and beneficial outcomes across interests could be achieved by using this smart approach in the coal program and PEIS as well.

The BLM must ensure that the mitigation components of the PEIS are consistent with all relevant laws and policies, including current mitigation guidance. Section IV includes the bulk of our recommendations on avoidance, the first and most important step in the mitigation hierarchy, and minimization, in recommending where, how and when to lease. This section is focused on compensatory mitigation for impacts to land, wildlife habitat, and other resources and values that are unavoidably impacted by coal leasing, exploration and development. Avoidance, minimization and compensatory mitigation for climate impacts from coal leasing, exploration and development are addressed in section VI.F.

A. BLM Must Ensure that the Mitigation Components of the PEIS Are Consistent with Current Mitigation Guidance, Including the Requirement for a Net Benefit or a Minimum of a No Net Loss Outcome.

Secretarial Order 3330, the report to the Secretary of Interior from the Energy and Climate Change Task Force, and the BLM's current mitigation guidance (IM No. 2013-142 and Draft Manual Section 1794), all direct the BLM to incorporate mitigation strategies into land use planning and programmatic evaluations such as this PEIS. BLM's final mitigation manual and handbook are forthcoming and will likely provide additional details and guidance, although we expect they will build on current requirements and our recommendations below will be consistent with the updated guidance.

More recent guidance in the form of the Presidential Memorandum: Mitigating Impacts on Natural Resources from Development and Encouraging Related Private Investment (2015) and the Department of the Interior’s Landscape-Scape Mitigation Manual (2015) also emphasize the importance of mitigation in BLM planning and decision-making. Key elements of these policies are summarized below and should be incorporated into BLM’s approach to mitigation in the PEIS:

- Landscape-scale approach: land use planning for conservation and energy development as well as analysis of proposed development and consideration of mitigation must use a landscape-scale approach to focus development in low-conflict areas and prioritize conservation in areas with important and sensitive resources and values.
- “Irreplaceable resources”: avoidance is the most appropriate tool for addressing “irreplaceable resources,” “resources recognized through existing legal authorities as requiring particular protection from impacts and that because of their high value or function and unique character, cannot be restored or replaced.”
- No net loss of important resources and values: mitigation must achieve a goal of no net loss of important resources and values, with a net benefit goal as required or appropriate.
- Climate change impacts and resilience: agencies must identify and promote mitigation measures that help address climate change impacts and resilience.
- Compensatory mitigation standards: compensatory mitigation (generally comprised of acquisition, restoration or preservation of resources and values) must be:
 - Durable: protected against non-conforming uses like development and lasting as long as the impacts;
 - Additional: demonstrably new conservation benefits that would not occur without mitigation;
 - Be developed based on the best available science: including for determining equivalency of impacts and mitigation benefits;
 - Provide for public transparency: including tracking locations of impacts and mitigation actions; and
 - Include monitoring and adaptive management.

Additional emphasis is appropriate for the no net loss/net benefit goal – the overarching goal of the mitigation approach in the PEIS should be to provide a net benefit for society as called for by the Presidential Memorandum. This would also be in accord with the MLA. *See* 30 U.S.C. § 201(a)(1) (providing that at the discretion of the Secretary of the Interior coal leasing tracts will be identified that provide for the “public interests”). If the net benefit goal or no net loss goal cannot be achieved for an area under consideration for leasing and development, it should not be considered for leasing and development.

We also recommend that the BLM emphasize the value of using preservation through special designations and conservation management as mitigation actions. Though compensatory mitigation has often focused on restoration, preservation is an incredibly important and valuable tool that can be used on its own or in concert with restoration. This is especially true for certain resources and values such as lands with wilderness characteristics that by definition are primarily intact and thus lend themselves to compensatory mitigation through preservation of other lands with equivalent values. The Solar PEIS explicitly provides for managing additional lands to

protect their wilderness characteristics as a form of compensating for unavoidable loss of lands with wilderness characteristics. *See*, Solar PEIS ROD, pp. 54-56. Further, recent Solar Regional Mitigation Strategies (SRMS) identify protective management as a form of compensatory mitigation and identify potential mitigation sites. *See, e.g.*, Colorado SRMS, Table 2-10, Figure 2-29; Arizona SRMS Table 2-5, Figure 2-12

Finally, we emphasize that the reclamation obligations imposed by the BLM and also fulfilled through the bonds held by the OSMRE or authorized states do not relieve the agency of its mitigation obligations. The bonds can assist in ensuring impacts are addressed, but this is not a substitute for avoiding impacts altogether or minimizing impacts through measures such as limiting surface disturbance and designing facilities to minimize destruction or interference with wildlife habitat and wildlife. The BLM has authority to incorporate mitigation requirements into special stipulations and mine plans, guided by standards set at the planning level, which will also set standards that the OSMRE or authorized states will follow in requiring and managing reclamation.

B. BLM should develop Regional Mitigation Strategies or Plans to Support the PEIS.

BLM's current mitigation policy under IM No. 2013-142 and Draft Manual Section 1794 (DM 1794) provides guidance on establishing both Regional Mitigation Strategies and Plans. For Regional Mitigation Strategies, it provides policies, procedures and instructions for "Developing strategies that identify and facilitate mitigation opportunities at the regional scale, including mitigation opportunities on both BLM-managed public lands and non-BLM-managed lands (other Federal lands, as well as Tribal, State, and private lands);" DM 1794 p. 1-1. For Regional Mitigation Plans, it provides policies, procedures and instructions for "Using the land use planning process to identify potential mitigation sites and measures (e.g., land treatments, infrastructure modification or removal) on BLM-managed lands at a regional level (including by considering and potentially incorporating any Regional Mitigation Strategies)." *Id.*

The policy goes on to provide additional details on what components these strategies and plans should include and how they should be developed. The BLM has already completed several Solar Regional Mitigation Strategies, including for the Dry Lake Solar Energy Zone described above. BLM is also developing a Regional Mitigation Strategy for oil and gas development in the National Petroleum Reserve-Alaska, and will be developing regional mitigation strategies for greater sage-grouse as well. These mitigation strategies also incorporate elements identified as part of regional mitigation plans, although they are not being prepared with NEPA analysis.

The BLM can and should develop an overarching mitigation strategy for the Coal PEIS. Further, to the extent that the BLM identifies priority areas or zones for coal leasing as part of this PEIS and amends underlying RMPs, BLM should include in the PEIS Regional Mitigation Plans for those priority areas or zones and incorporate the Plans into the underlying RMPs through the PEIS. The PEIS should also commit to development of Regional Mitigation Plans or Strategies to support future priority areas or zones that may be designated through future land use planning.

Further, as noted above, BLM has identified mitigation sites and potential actions in the SRMS it has prepared. In addition to identifying these sites, the BLM can ensure that the potential for

mitigation actions to be conducted in these sites, including preservation, is safeguarded through interim management direction. The BLM can identify these “pools” for mitigation actions in Regional Mitigation Strategies or Regional Mitigation Plans and also direct that they be protected from actions that could harm their potential function.

Though both Regional Mitigation Strategies and Plans are very valuable, BLM should pursue opportunities to complete the NEPA analysis necessary to select mitigation sites and approve mitigation actions through development of Regional Mitigation Plans whenever possible. Doing so also provides the opportunity to add durability and additionality to mitigation sites through special designations or management decisions (e.g. managing lands with wilderness characteristics for protection). Such special designations or management decisions will also help ensure that the viability of the mitigation sites is maintained between the finalization of the Regional Mitigation Plan and leasing, exploration, and development of priority areas or zones. Incorporating Regional Mitigation Plans into the underlying RMP will greatly increase the value of the Plans in providing a predictable and efficient process and maximally beneficial outcomes for compensatory mitigation. It is also consistent with BLM’s emphasis on landscape-level planning found in Planning 2.0. We note that even if a Regional Mitigation Strategy is developed instead of a Plan, the additional benefits described above can be achieved by incorporating the Strategy into the underlying RMP. However, the BLM should use the opportunity that this PEIS provides to start out with Regional Mitigation Plans that are incorporated into the underlying RMPs through the PEIS as much as possible.

Recommendations: The BLM must ensure that the mitigation components of the PEIS are consistent with all relevant laws and policies, including current mitigation guidance. This includes the use of a landscape-scale approach, an emphasis on a net benefit outcome, the importance of preservation as a mitigation action, and the use of Regional Mitigation Strategies and Plans to support the PEIS. A Regional Mitigation Strategy for the Coal PEIS would set an important framework to guide additional Regional Mitigation Strategies and Regional Mitigation Plans. Mitigation should be analyzed at both the land use planning stage and at the regional coal leasing stage via NEPA-based EISs that adopt the required mitigation policies. The mitigation policy should be made applicable to existing mines and areas in the vicinity of existing mines that are proposed for mining, as well as to new areas that might be open for mining consideration.

VI. THE PEIS MUST ADDRESS CLIMATE CHANGE IMPACTS RELATED TO THE FEDERAL COAL PROGRAM, INCLUDING RELATED MITIGATION.

A. Introduction

The need to address climate change impacts in the Coal PEIS has been raised above; in this Section we will address this issue in more detail. We also note that while the PEIS is fundamentally directed at the coal leasing and development program, our concerns about climate change relate to all fossil fuels that are produced from the federal mineral estate—oil, natural gas, and coal, as well as oil shale and tar sands. Thus, this Section of our comments applies to climate change issues that are created from fossil fuel extraction on the federal mineral estate, not just coal production. While the immediate opportunity—and indeed the carbon necessity—

starts with the climate change impacts of coal, the analysis should not end there and oil, natural gas, oil shale and tar sands should also be included in a Department-wide analysis as soon as possible. Both the emissions causing climate change and the unavoidable impact of climate change, including social costs and changes to landscapes, need to be addressed.

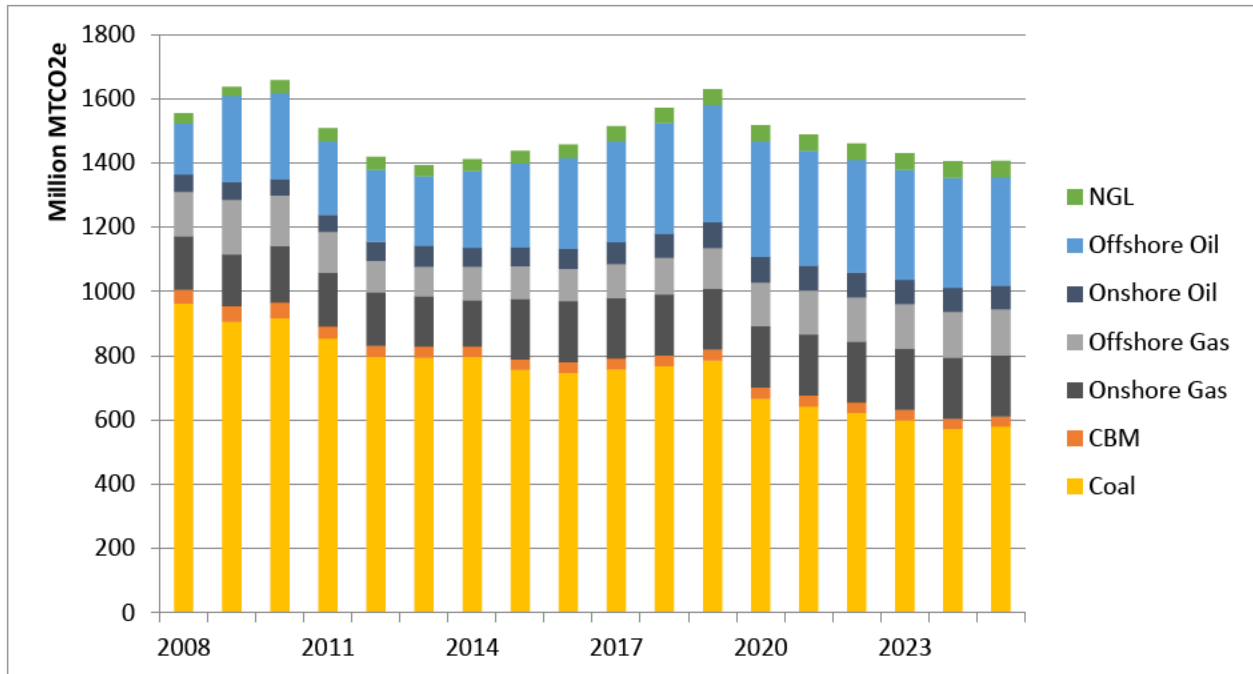
Fossil fuels production on federal public lands and mineral estate is extensive and the production of greenhouse gasses (GHG) resulting from the exploration, extraction, transportation and combustion of these fuels is significant. The climate change impacts we are seeing from GHG emissions are already evident and will worsen unless emissions of GHG are greatly reduced. The wide range of impacts from climate change, including melting glaciers and earlier snow melts in our mountains that disrupt water supplies in the west, forest fires, widespread drought, rising sea levels, and the spread of invasive species, have been rigorously and scientifically documented by the Intergovernmental Panel on Climate Change, as well as American researchers and agencies. These have led to substantial commitments made by this Administration to reduce our national contribution to climate change. As part of these commitments, federal agencies are required to take climate change impacts into account in decision-making.

Our public lands and minerals are held in trust for the public. We must ensure this trust is not broken when fossil fuels are leased and developed on these lands. The federal fossil fuels program, including the coal program, must provide assurance the public trust will not be violated by carefully considering climate change issues and taking steps to avoid, minimize and offset impacts through compensatory mitigation.

In 2012 as much as 21 percent of the Nation's GHG emissions originated from coal, oil and natural gas extracted from the public lands, with coal contributing over 57 percent of this. Federally produced coal is contributing roughly 10 percent to U.S. GHG emissions.¹⁹

Table 5. TWS Analysis of Lifecycle Emission from Federal Lands by Fuel Type

¹⁹ Claire Moser, Joshua Mantell, Nidhi Thakar, Chase Huntley and Matt Lee-Ashley. *Cutting Greenhouse Gas from Fossil-Fuel Extraction on Federal Lands and Waters*. March 19, 2015. Policy brief and underlying analysis is available at <http://wilderness.org/blog/blind-spot-plan-reduce-emissions-slowing-progress-fight-against-climate-change> (accessed July 28, 2016).



There are three critical needs relative to BLM decision-making and climate change, including for the federal coal program. First, the agency must provide an accurate and comprehensive assessment of the *amount* of GHG produced by its fossil fuel program activities. Second, it must ensure a fair and comprehensive assessment of the *impacts* of these GHG emissions. It is critical that two GHG in particular receive treatment in these analyses: carbon dioxide (CO₂) and methane (CH₄), both of which are emitted at significant levels as a result of the federal coal leasing and development program. Third, it must commit to avoiding, minimizing and offsetting impacts through compensatory mitigation.

B. The BLM is Obligated to Measure and Disclose to the Public Reasonably Foreseeable Climate Change Emissions and Associated Impacts from the Federal Coal Program.

1. Guidance from the President, Department of the Interior and CEO.

S.O. 3289 unequivocally mandates all agencies within the Department of the Interior “analyze potential climate change impacts when undertaking long-range planning exercises, setting priorities for scientific research and investigations, developing multi-year management plans, and making major decisions regarding potential use of resources under the Department’s purview.” S.O. 3289 (Addressing the Impacts of Climate Change on America’s Water, Land, and Other Natural and Cultural Resources), *incorporating* S.O. 3226 (Evaluating Climate Change Impacts in Management Planning). Activities such as the PEIS must meet these requirements. Notably, S.O. 3338, in directing preparation of the PEIS, cites the need to address climate change as one of the main purposes for this evaluation of the coal program.

Making the case for the need to consider climate change in NEPA documents, the Council on Environmental Quality (CEQ) issued its revised draft Climate Change NEPA Guidance in December, 2014.²⁰ It provides direction to all agencies on when and how to consider the effects of GHG emissions and climate change in the evaluation of federal actions. The guidance states that, “[i]t is essential . . . that federal agencies not rely on boilerplate text to avoid meaningful analysis, including consideration of alternatives or mitigation.” The CEQ draft guidance provides detailed reasons and instruction on how climate change and GHG NEPA analyses can be effectively accomplished. Any “boilerplate” claims that GHG and climate change analyses are impossible are rejected.

The Department of the Interior’s Departmental Manual on Mitigation clearly states in its principles for implementing mitigation that it will “Identify and promote mitigation measures that help address the effects of climate change and improve the resilience of our Nation’s resources and their values, services, and functions.” Manual Section 6.6.F on p. 6. It goes on to say that this includes “Considering greenhouse gas emission in project design, analysis, and development of alternatives.” Manual Section 6.6.F.(6) on p. 7. Though our recommendations on avoiding, minimizing and mitigating impacts from GHG emissions from the federal coal program are discussed in further detail in Section VI.F, we include these citations here because they underscore the fact that the BLM must have an accounting for the amount of GHG emissions and climate change impacts from its coal program in order to mitigate for those impacts.

S.O. 3330 (Improving Mitigation Policies and Practices of the Department of the Interior) as well as the report to the Secretary of the Interior from the Energy and Climate Change Task Force,²¹ and the BLM’s current mitigation guidance (IM No. 2013-142 and Draft Manual Section 1794), all also direct the BLM to incorporate mitigation strategies into planning and to address climate change. S.O. 3330 notes that a key reason for issuing the new policy is to “focus on mitigation efforts that improve the resilience of our Nation’s resources in the face of climate change.” More recent guidance in the form of the Presidential Memorandum: Mitigating Impacts on Natural Resources from Development and Encouraging Related Private Investment (2015) and the Department of the Interior’s Landscape-Scape Mitigation Manual (2015) also emphasize the importance of mitigation in BLM planning and decision-making and how it can and should apply in the context of addressing impacts from climate change. Again, the BLM must have an accounting for the amount of GHG emissions and climate change impacts from its coal program in order to mitigate for those impacts.

²⁰ Available at <https://www.whitehouse.gov/administration/eop/ceq/initiatives/nepa/ghg-guidance>.

²¹ Clement, J.P. et al. 2014. *A strategy for improving the mitigation policies and practices of the Department of the Interior*. A report to the Secretary of the Interior from the Energy and Climate Change Task Force, Washington, D.C.

2. Applicable requirements of NEPA.

NEPA requires all significant environmental impacts to be considered in an EIS. The “twin aims” of NEPA are to “consider every significant aspect of the environmental impact of a proposed action” and to “ensure that the agency will inform the public that it has indeed considered environmental concerns in its decisionmaking process.” *Baltimore Gas & Elec. Co. v. Natural Res. Def. Council*, 462 U.S. 87, 97 (1983). BLM must fully analyze the cumulative and incremental impacts of proposed decisions, including climate change impacts. *Center for Biological Diversity v. Nat’l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008). In that case, the NHTSA failed to provide analysis for the impact of greenhouse gas emissions on climate change and was rebuked by the U.S. Court of Appeals for the Ninth Circuit, which observed that, “[t]he impact of greenhouse gas emissions on climate change is precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct.” 538 F.3d at 1217.

Further, NEPA regulations require that NEPA documents address not only the direct effects of federal proposals, but also “reasonably foreseeable” indirect effects. These are defined as:

Indirect effects, which are caused by the action and are later in time or farther removed in distance, *but are still reasonably foreseeable*. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.” 40 C.F.R. § 1508.8(b) (emphasis added).

That said, the law is well settled that NEPA only establishes procedural requirements for agencies to follow, it does not establish substantive environmental protection mandates. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989). Nevertheless, NEPA is intended to be “action-forcing” so as to achieve its environmental protection policies, and consideration of mitigation is an important element of that. *Id.* at 350, 351; *see also* 40 C.F.R. § 1502.1 (stating the primary purpose of an EIS is to be “action-forcing” so as to ensure the policies and goals of NEPA are infused into agency decision-making). Therefore, as detailed in Section V.F., an important element of the coal program PEIS will be consideration of climate change mitigation options, and under the climate change commitments this country has made (discussed below), development of mitigation measures will be required.

3. National commitments to reduce greenhouse gas emissions.

The context for these requirements, as noted above, is the important commitments made by this Administration regarding climate change. One of these commitments is a GHG reduction strategy. The United States has submitted its target to cut net GHG emissions to the United Nations Framework Convention on Climate Change. This Intended Nationally Determined Contribution (INDC), as provided for in the Paris Agreement, is a formal statement of the U.S. target to reduce emissions by 26 to 28 percent below 2005 levels by 2025. In addition, to achieve a no more than 2 degrees C temperature increase, heat trapping gasses in the atmosphere must be kept at or below 450 parts per million CO₂-eq., which means that industrialized nations like the U.S. will have to reduce their emissions an average of 70 to 80 percent below 2000 levels by

2050. This will require that a carbon budget be developed that limits carbon emissions from federal energy development in order to keep emissions below 500m metric tons CO₂-eq by 2050. The need for a coal program budget will be discussed in detail in Section VI.E.

In addition, on June 29, 2016, the leaders of Canada, Mexico, and the United States committed to the North American Climate, Clean Energy, and Environment Partnership. Under this agreement the countries will pursue an historic goal for North America to strive to achieve 50 percent clean power generation by 2025. “Canada, the U.S., and Mexico will work together to implement the historic Paris Agreement, supporting our goal to limit temperature rise this century to well below 2 degrees C, and pursuing efforts to limit the temperature increase to 1.5 degrees C.”²²

These commitments are consistent with and required by The President’s Climate Action Plan (June 2013) which calls for many steps to combat climate change such as reductions in CO₂ emissions from power plants, increased use of renewable energy, improved automobile efficiency standards, and reducing methane emissions, among many other things.²³ But to achieve the goals of the Climate Action Plan, which include “steady, responsible action to cut carbon pollution, [so] we can protect our children’s health and begin to slow the effects of climate change so that we leave behind a cleaner, more stable environment,” it will also be necessary to address issues related to fossil fuel extraction from our public lands. The Coal PEIS and other BLM regulatory actions should look to these commitments as part of decision-making, in order to ensure that steps are taken to meet these commitments.

4. Court cases requiring analysis of GHG emissions.

In the context of the federal coal program, there have been an increasing number of court decisions requiring federal agencies to present an analysis of GHG emissions in their coal program NEPA analyses, including downstream emissions. The indirect effects—such as burning the coal to generate electricity and thereby producing GHG—must be considered. Four cases where the agency did not take the required NEPA “hard look” at downstream emissions of the combustion of coal included:

- *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F. Supp. 3d 1174 (D. Colo. 2014).
- *Dine Citizens Against Ruining our Env’t v. Office of Surface Mining Reclamation and Enforcement [OSMRE]*, 82 F. Supp. 3d 1201 (D. Colo. 2015).
- *Wild Earth Guardians v. OSMRE*, 104 F. Supp. 3d 1208 (D. Colo. 2015).
- *Wild Earth Guardians v. OSMRE*, No. CV 14-103-BLG-SPW (D. Mt., Oct. 32, 2015, Jan 21, 2016).

²² See <https://www.whitehouse.gov/the-press-office/2016/06/29/leaders-statement-north-american-climate-clean-energy-and-environment> (presenting Leaders’ Statement on a North American Climate, Clean Energy, and Environment Partnership).

²³ See also Climate Action Plan Strategy to Reduce Methane Emissions (March 2014) (presenting the President’s methane reduction strategy).

As a result, the agencies' NEPA analyses were invalidated and the agencies have been forced to conduct additional analyses. In another case the court held that the analysis of downstream emissions was adequate party because emissions from coal combustion had already been disclosed. *Wild Earth Guardians v. OSMRE*, 120 F.Supp.3d 1237 (D. Wyo. 2015).

The BLM should clearly present information on the amount of GHG that are produced by the federal coal program, both upstream and downstream, in the PEIS. This would be consistent with the requirements of S.O. 3338 and the BLM's statements in the Federal Register notice announcing the PEIS.

5. Reliable methods and tools exist to measure and disclose the amount of greenhouse gas emissions from federal coal.

On the same day Secretary Jewell issued S.O. 3338, she also issued several good governance policies designed to improve the effectiveness of permitting, including directing the Interior Department's U.S. Geological Survey to establish and maintain a public database to account for the annual carbon emissions from fossil fuels developed on federal lands and waters. The agency has estimated a delivery date of 2018 for that tool.²⁴ In the interim, there are a number of well-recognized methods available for assessing the amount of CO₂-eq and methane emissions that result from federal fossil fuels leasing and development. These include downstream amounts, such as those resulting from the combustion of coal primarily for electricity generation. These methods can be used in the PEIS to estimate GHG emissions resulting from the federal coal program. Methods such as the Greenhouse Gas Protocol and the EPA's GHG Reporting Rule can provide estimates of the GHG emissions levels from federal fossil fuel programs, including the coal program. The PEIS should employ these methods.

Recommendations: The BLM is clearly required to measure, evaluate and fully consider the GHG emissions and climate change impacts of the federal coal program in the PEIS based on a number of policies of the BLM and other agencies, and even the President. NEPA also requires the BLM to fully consider climate change issues in the PEIS. This must include both upstream and downstream emissions, including those from coal combustion at power plants. This analysis must inform BLM's requirements to avoid, minimize and compensate for these impacts consistent with this country's climate change commitments, specifically the requirement to reduce emissions by 26 to 28 percent below 2005 levels by 2025. This analysis and decision-making should seek to achieve a no more than 2 degrees C temperature increase, which will require the U.S. to reduce emissions an average of 70 to 80 percent below 2000 levels by 2050. The PEIS should put in place requirements to achieve these commitments.

C. The BLM Must Disclose Climate Change Impacts in its NEPA Analyses.

In addition to disclosing the *amounts* of GHG emitted as a result of its coal program, and other programs, the BLM must also disclose the *impacts* of those emissions in its NEPA analyses. NEPA specifically requires federal agencies to analyze and disclose the environmental effects of

²⁴ See Q&A Department of the Interior Federal Coal Reforms, available at http://www.blm.gov/style/medialib/blm/wo/Communications_Directorate/public_affairs/news_release_attachments.Par.98291.File.dat/Questions%20and%20Answers%20Coal.pdf.

their actions. 40 C.F.R. § 1508.8. Where “information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known,” NEPA regulations direct agencies to evaluate a project’s impacts “based upon theoretical approaches or research methods generally accepted in the scientific community.” 40 C.F.R. § 1502.22(b)(4).

A number of tools exist that BLM could use to conduct an evaluation of climate change impacts. Some of these tools are more developed than others and some may be finalized while the PEIS is proceeding. BLM should ensure that any and all tools used can meaningfully quantify impacts of GHG emissions.

1. BLM should use one or more generally-accepted approaches to assess climate impacts.

The BLM must employ one or more accepted approaches to assess climate impacts associated with potential future leasing, and require those approaches be used in future significant leasing decisions. Any such method should be based on the best available science and be generally accepted as rigorous and transparent.

The Social Cost of Carbon (SCC) is a leading tool for quantifying the climate impacts of proposed federal actions. The SCC is an estimate, in dollars, of the long term damage caused by a one ton increase in carbon dioxide (CO₂) emissions in a given year; or viewed another way, the benefits of reducing CO₂ emissions by that amount in a given year. The SCC is intended to be a comprehensive estimate of climate change damages that includes, among other costs, the changes in net agricultural productivity, risks to human health, and property damages from increased flood risks. The method was initially designed for application in rulemakings, but the courts have recognized its applicability to NEPA analyses.²⁵

The SCC was developed through a rigorous multi-agency process based on generally accepted research methods and years of peer-reviewed scientific and economic studies. In 2010, an interagency working group was convened by the Council of Economic Advisers and the Office of Management and Budget to design an SCC modeling exercise and develop estimates for use in rulemakings. The interagency group was comprised of scientific and economic experts from the White House and federal agencies, including: Council on Environmental Quality, National Economic Council, Office of Energy and Climate Change, and Office of Science and Technology Policy, EPA, and the Departments of Agriculture, Commerce, Energy, Transportation, and Treasury. The interagency group identified a variety of assumptions, which EPA then used to estimate the SCC using three integrated assessment models, which each combine climate processes, economic growth, and interactions between the two in a single modeling framework.

This method has undergone careful peer review from a number of agencies and has been subject to updates and revisions, and considerable public comment. For example, see the Office of Management and Budget's (OMB) SCC site, which presents the OMB response to the public comments received through its solicitation for comments on use of SCC estimates in Federal

²⁵ See *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F. Supp. 3d 1174 (D. Colo. 2014).

regulatory analyses.²⁶ In this response, OMB announced plans to obtain expert, independent advice from the National Academies of Sciences, Engineering, and Medicine on how to approach future updates to the estimates. This panel is concluding its review but published an interim review generally reaffirming the methods used to develop the SCC for use in evaluating proposed federal actions.²⁷

In addition, the Environmental Protection Agency (EPA) has developed a companion protocol called the Social Cost of Methane method, focusing on methane emissions. These methods provide a way to quantify the costs of GHG emissions and present them to the public. Since the benefits of the production of fossil fuel production are regularly monetized in BLM's NEPA documents, it is critical that the *impacts* also be monetized.

The SCC protocol is relatively simple, involving the following steps: (1) identify the amount of coal produced, (2) estimate the tons of CO₂ generated from the exploration, extraction, processing, transport and combustion of this coal, (3) multiply the amount of CO₂ produced times a factor provided from the appropriate discount rate from the SCC tables, and (4) get a total SCC by adding the amounts for each year that coal mining would occur. To achieve an accurate assessment of the impacts of GHG emissions, some experts have said lower discount rates (3 percent or lower) should be applied in the SCC model.

There is at least one court case supporting the use of the SCC protocol. In *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F. Supp. 3d 1174 (D. Colo. 2014), a case involving coal mining EISs, the court rejected claims that it was too speculative to estimate coal combustion emissions when the SCC method was available to the agency and had been recognized earlier by the agency. This was particularly true because the agency presented the *benefits* of the project in a monetary form. By refusing to quantify the climate change costs of the project, the agency effectively zeroed out the costs of greenhouse gasses. Presenting only a project's economic upsides while omitting a projection of the project's costs was arbitrary and capricious and violated NEPA.

However, the SCC has some limitations. The method is recognized as an underestimate of the total likely damages associated with a proposed action.²⁸

Nevertheless, CEQ recognized in its Draft Guidance that the SCC “offers a harmonized interagency metric” that can provide context for a meaningful NEPA review. Thus, as the leading tool to quantify economic damage likely from a proposed action, the SCC and the EPA

²⁶ See <https://www.whitehouse.gov/omb/oira/social-cost-of-carbon>. (Accessed July 25, 2016.)

²⁷ National Academies of Sciences, Engineering, and Medicine. (2016). *Assessment of Approaches to Updating the Social Cost of Carbon: Phase 1 Report on a Near-Term Update*. Committee on Assessing Approaches to Updating the Social Cost of Carbon, Board on Environmental Change and Society. Washington, DC: The National Academies Press.

²⁸ EPA concluded, “The models used to develop SC-CO₂ estimates, known as integrated assessment models, do not currently include all of the important physical, ecological, and economic impacts of climate change recognized in the climate change literature because of a lack of precise information on the nature of damages and because the science incorporated into these models naturally lags behind the most recent research. **Nonetheless, the SC-CO₂ is a useful measure to assess the benefits of CO₂ reductions.**”

<https://www3.epa.gov/climatechange/EPAactivities/economics/scc.html> (emphasis added). Accessed July 25, 2016.

SCM clearly can assist in quantifying the costs associated with GHG emissions, that is, the impacts of climate change. At a minimum, we therefore believe these tools should be applied in the Coal PEIS.

Additional means to assess the impacts of carbon dioxide and methane emissions should also be pursued. These additional approaches should, at a minimum, be consistent with existing guidance including the BLM's guidance on estimating non-market environmental values (Instruction Memorandum No. 2013-131 Change 1) and the CEQ Draft Guidance.

One alternative method identified by the National Academies of Science is an iterative risk management assessment. In a risk management assessment the BLM would consider means to reduce or respond to GHG emissions such as through mitigation, adaptation, geo-engineering, or an improved knowledge base. Many responses are possible for estimating risk reduction potential. Such a method should seek to pursue the most feasible options, pursue options with the lowest costs and good cost effectiveness, put in place options with proven effectiveness, ensure equity and fairness, and be robust to the uncertainties surrounding climate change. The approximate costs would then serve as the basis for determining the risk cost of a proposed action.²⁹

2. Climate change impacts should be analyzed from a global perspective.

It is also critical that the BLM assess climate change impacts from a global perspective, not just a local or even national perspective. The PEIS is national in scope—this is a perfect time to look at the overall impacts of GHG emissions and not claim individual impacts are too small.

Addressing impacts globally is part of a strategy to encourage other nations to take steps to address climate change that will directly benefit Americans. Moreover, issues such as climate change and clean air are globally common resources available to all, but any one country's degradation or harm to these resources impacts the whole world. Carbon pollution is not limited to the area where it is released, but rather it mixes and travels freely throughout the world and affects the climate worldwide. The carbon and methane pollution in this country not only impacts the U.S., it also imposes externalities on the rest of the world. And when other countries take steps to reduce their climate change emissions, it also benefits the U.S. If we only set our GHG emission strategies based on domestic costs and benefits while ignoring global consequences there would be a significant reduction in climate protection benefits and significantly increased risks of harms, including to the United States.

As stated in CEQ's Draft Guidance, "the statement that emissions from a government action or approval represent only a small fraction of global emissions is more a statement about the nature of the climate change challenge, and is not an appropriate basis for deciding whether to consider climate impacts under NEPA This approach does not reveal anything beyond the nature of the climate change challenge itself: the fact that diverse individual sources of emissions each make relatively small additions to global atmospheric GHG concentrations that collectively have huge impact." There is little doubt that the consideration of indirect impacts that is required

²⁹ See *America's Climate Choices*, National Academy of Sciences, National Research Council at 46-50 (presenting and discussing these issues).

under the CEQ NEPA regulations includes consideration of different scales of impacts. 40 C.F.R. § 1508.8(b). Therefore, the assessment of climate change impacts in the PEIS should clearly be on a global scale.

3. BLM should not assume perfect substitution in analyzing GHG impacts.

Related to the issue of ensuring there is a global and life-cycle analysis of GHG impacts on climate change is the question of “perfect substitution” by other coal from other sources for federal coal that is not mined. Some claim that “perfect substitution” will occur if there is less federal coal mined, and therefore any climate change and other benefits of the reduction in federal coal supply will be nullified. This argument has no basis. Much (85 percent) of the federal coal is mined in the Powder River Basin in Wyoming and Montana. This coal is notable for being low cost and having low sulfur content relative to other sources of coal in the U.S. What this means is that if Powder River Basin coal is not produced, the costs of other coal will make these sources less economically attractive than the Powder River Basin coal. In addition, it will not have the low sulfur (reduced air pollution) benefits of the Powder River Basin coal. That is, there will not be a basis for “perfect substitution.”

Moreover, given the higher prices and higher sulfur content of alternative sources of coal and the availability of renewable forms of energy with no (or very little) GHG emissions and increased energy efficiency measures, there will likely be “fuel switching” market decisions made by companies. Companies will choose to switch from coal to renewable forms of energy, or natural gas, in many cases, which will reduce climate change impacts.

Perfect substitution of other coal for federal coal that is not mined is an unfounded myth and should not be used to avoid evaluating climate change impacts in the PEIS. This theory is not based on empirical evidence and it is not supported by economic theory. In addition, there have been several recent papers that bring into question the perfect substitution theory by the White House Council of Economic Advisors, Vulcan Philanthropy, Stockholm Environment Institute, and the Carbon Tracker Initiative.³⁰

The substitution question has been addressed relative to the federal offshore oil and natural gas leasing program where one court noted that fuel switching would lead to greater conservation: “forgoing additional leasing on the [outer continental shelf] would cause an increase in the use of substitute fuels . . . and a reduction in overall domestic energy consumption from greater efforts to conserve in the face of higher prices.” *Ctr. for Sustainable Economy v. Jewell*, 779 F.3d 588, 609 (D.C. Cir. 2015).

³⁰ CEA. 2016. “The Economics of Coal Leasing on Federal Lands: Ensuring a Fair Return to Taxpayers”. Council of Economic Advisers. May 2016.

Vulcan/ICF. 2016. “Federal Coal Leasing Reform Options: Effects on CO₂ Emissions and Energy Markets. Final Report: Summary of Modeling Results.” A Vulcan Philanthropy | Vulcan, Inc. report with analysis supported by ICF International, Fairfax, VA. February 2016.

Erickson, Peter and Lazarus, Michael. “How would phasing out U.S. federal leases for fossil fuel extraction affect CO₂ emissions and 2°C goals?” Stockholm Environment Institute, Working Paper 2016-02. May 2016.

Fulton, Mark; Kaplow, Doug; Capalino, Reid; and Grant, Andrew. “Enough Already: Meeting 2°C PRB Coal Demand Without Lifting the Federal Moratorium.” July 2016.

4. Local impacts must also be considered.

While the BLM must ensure there is a global analysis of climate change impacts in the PEIS, and impacts due to other fossil fuels decisions, it also cannot exclude local climate change and other local environmental impacts. The BLM often expresses the monetary benefits of the coal program on a local level—county employment benefits, county tax benefits, etc. The SCC is well adapted to assessing impacts on a broad, global, level but may not be as well suited to a consideration of local monetary impacts. The BLM should ensure that there is also a local consideration of the costs of the coal program in the PEIS—both relative to climate impacts and of other environmental and social impacts. The local benefits of “fuel switching” to things like greater reliance on development of renewable sources of energy in local areas should be fully considered in the PEIS.

In addition, BLM should take a hard look at the short- and long-term impacts of each alternative on carbon storage. BLM lands can be an important carbon “sink” that functions to store carbon and keep it out of the atmosphere. BLM has a duty under FLPMA to prepare a current and up-to-date inventory of public lands and their new and emerging resource values. 43 USC § 1711. This more local issue should also be considered the PEIS.

Recommendations: The second critical step in analyzing climate change issues in the PEIS after determining the amount of GHG that are emitted is to evaluate the climate change impacts of those emissions. This can be done by utilizing the Social Cost of Carbon (and companion EPA Social Cost of Methane) protocol. The BLM should use this method for climate change impact assessment in the PEIS. But in addition, due to some shortcomings in the SCC method, the BLM must also evaluate qualitative, non-monetary impacts that are caused by climate change, such as from earlier snowmelts in our western mountains that are changing water supplies. This analysis should be done from a global perspective because as recognized in the CEQ Climate Change NEPA Guidance, “diverse individual sources of emissions each make relatively small additions to global atmospheric GHG concentrations that collectively have huge impact.” That said, local impacts also need to be considered especially since the BLM has traditionally published the local monetary benefits of the coal program in its NEPA analyses. BLM should not assume that federal coal that is not produced will simply be replaced by production from other sources (so-called “perfect substitution”) thus eliminating any climate change benefits —this unfounded myth is not based on empirical evidence or sound economic theory, and it has been rejected in several reports.

D. The BLM Should Establish Carbon Emission Targets for Future Coal Leasing Based on U.S. Climate Commitments and Expected Future Leasing and Production Scenarios (a so-called “Carbon Budget”).

1. Introduction.

Secretarial Order 3338 clearly states that concerns regarding whether the federal coal program was in conflict with the nation’s climate policies and climate goals was one of the three most

significant issues that were identified.³¹ Similarly, the Notice of Intent clearly stated that the public concern raised during listening sessions in 2015 led to the agency’s consideration of these questions: “Many stakeholders highlighted the tension between producing very large quantities of Federal coal while pursuing policies to reduce U.S. GHG emissions substantially, including from coal combustion.” NOI, p. 21. As recognized in the S.O. federal coal production represents approximately 41 percent of the total coal produced in the U.S. and when combusted, contributes about 10 percent to total U.S. GHG emissions. Accordingly, the NOI instructed that the PEIS should assess the climate impacts of the federal coal program, including coal combustion, and how those impacts should be addressed in coal program management, including “how best to ensure no undue or unnecessary degradation of public lands from climate change impacts.” NOI, p. 21

In that vein, a critical element of the S.O. is increasing the transparency of energy leasing and production activities on public lands. We believe reforms to the manner and terms of leasing are essential. But without a commitment to ensuring that the Department of the Interior (as the nation’s largest energy asset manager) measures and discloses to the American public the carbon performance of current and expected future energy leasing and production, comprehensive reform will fall short of the Department’s intended goals.

2. Definition of a “carbon budget.”

A “carbon budget” is often defined as the quantity of carbon dioxide that the nations of the world can emit and still limit warming to 2-degree C above pre-industrial levels, although recently it has been applied to determine quantities of fossil energy that could be burned by individual nations consistent with their commitments.

While there appears to be general agreement on the conceptual definition of “carbon budget,” the operational use of the term varies widely. It has been in use in the forestry and agricultural sector for years in the sense of bookkeeping for stocks and flows due to annual variation, including harvest and natural or man-made perturbations like wildfire, whereas the term has been used as short-hand for a fixed cap on emissions across the full carbon cycle in some climate policy circles.

In the context of these comments, **we use the term “carbon budget” to refer to the estimated annual volumes of CO2 advisable from federal lands under international goals set by leading climate science and prevailing national climate emissions reduction commitments.** To us, these volumes function best as performance targets set as a matter of policy rather than as a hard and fast cap. We believe BLM can create a “carbon budget” to establish a CO2 emission reduction target that takes into consideration our domestic and international climate commitments and can be used as a policy and decision-making tool when addressing the questions of when and how much fossil fuel development should be permitted on federal land.

³¹ The Order clearly notes the tension between international emissions reduction pledges and the carbon emissions resulting from federal coal. See SO 3338, p 4.

3. Support for conceptual framework for a “carbon budget.”

The concept of a carbon budget builds upon the well-established scientific understanding that the global increase in temperature due to greenhouse gas emissions must be capped at or below 2-degree C to avoid unmanageable climate change consequences. The 2-degree C threshold was first enshrined in the 2009 Copenhagen Accord³² and reaffirmed in the 2015 Paris Agreement as the limit for “acceptable” warming.³³

During that time, the international scientific community’s understanding of the interaction between fossil fuel development and temperature thresholds has greatly increased, and today it is widely agreed that development of additional reserves should be considered in the context of warming goals—giving rise to the idea of a carbon budget for the planet. In fact, this notion has been assessed and supported by the IPCC in all assessment reports going back to 1990 and has yielded a methodology routinely employed and updated annually by the Global Carbon Project.³⁴

The IPCC’s analytic method was further advanced in January 2015 in a paper published in the scientific journal *Nature* entitled “The geographical distribution of fossil fuels unused when limiting global warming to 2 degrees C.”³⁵ The study evaluates known fossil fuel reserves to determine, based on current emissions factors and global warming potential, how much should be left in-place to maximize the planet’s chances of remaining below 2 degrees C. Importantly, it quantifies the regional distribution of known fossil-fuel reserves and resources and, through modeling a range of scenarios based on least-cost climate policies, identifies geographically-specific resources that should not be burned between 2010 and 2050 to ensure the world stays

³² Copenhagen Accord ¶ 1, *agreed* Dec. 18, 2009, FCCC/CP/2009/11/Add.1, *available at* <http://unfccc.int/resource/docs/2009/cop15/eng/11a01.pdf> (“recognizing the scientific view that the increase in global temperature should be below 2 degrees Celsius” relative to pre-industrial temperatures to “stabilize greenhouse gas concentration in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system”); *id.* at ¶ 2 (agreeing that “deep cuts in global emissions are required according to science” to meet this goal).

³³ The United States and other signatory nations committed to reducing greenhouse gas emissions “well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels.” Paris Agreement art. 2, ¶ 1(a), *adopted* Dec. 12, 2015, FCCC/CP/2015/L.9, *available at* <http://unfccc.int/resource/docs/2015/cop21/eng/109r01.pdf>. The authority cited in the letter is being provided via regulations.gov and it should be included in the administrative record for this decision.

³⁴ The IPCC has produced and reviewed a carbon budget for the planet in all assessment reports (Ciais et al., 2013; Denman et al., 2007; Prentice et al., 2001; Schimel et al., 1995; Watson et al., 1990), as well as by others (e.g. Ballantyne et al., 2012). These assessments included carbon budget estimates for the decades of the 1980s, 1990s (Denman et al., 2007) and, most recently, the period 2002–2011 (Ciais et al., 2013). The IPCC methodology has been adapted and used by the Global Carbon Project (GCP, www.globalcarbonproject.org), which has coordinated a cooperative community effort for the annual publication of global carbon budgets up to the year 2005 (Raupach et al., 2007), 2006 (Canadell et al., 2007), 2007 (published online; GCP, 2007), 2008 (Le Quéré et al., 2009), 2009 (Friedlingstein et al., 2010), 2010 (Peters et al., 2012b), 2012 (Le Quéré et al., 2013; Peters et al., 2013), 2013 (Le Quéré et al., 2014), and most recently 2014 (Friedlingstein et al., 2014; Le Quéré et al., 2015). Each of these papers updated previous estimates with the latest available information for the entire time series. From 2008, these publications projected fossil fuel emissions for one additional year using the projected world gross domestic product (GDP) and estimated trends in the carbon intensity of the global economy (Rogelj, 2016).

³⁵ McGlade, Christophe and Paul Ekins, *The Geographical Distribution of Fossil Fuels Unused When Limiting Global Warming to 2 °C*, 517 *Nature* (187) (2015).

within a 2-degree C limit in the most cost-efficient manner.³⁶ This study demonstrates two important facts: first, one way in which geographically-specific analysis can be undertaken to make comparative judgments about the appropriateness of tapping into different resources and plays, and, second, that policy priorities can be brought into such an analysis—in McGlade et al it was cost-efficiency, but priorities like land use intensity, water demand, or impact on sensitive resources could as well. In addition to being the analytic source of ignition for the self-proclaimed “Keep it in the Ground” movement, the paper spawned a number of related inquiries looking at modified scenarios and derivative analysis examining U.S. demand scenarios in the specific context of already-leased federal fossil energy resources.³⁷ Attachment 1 provides a fuller discussion of the literature.

Reaching international climate commitments, including the Paris Agreement goals, will require the U.S. to adopt measures that reduce the GHG associated with production of fossil fuels on public lands in addition to efforts to reduce GHG from power plants and fuel efficiency for vehicles.³⁸ Nearly all other significant federal activities have had GHG reduction targets set for them (see Appendix 1)—it is time to put a similar set of performance targets in place for federal fossil energy leasing and production. As described below, it also will require measures that phase down the supply of fossil fuels from federal lands starting with the coal PEIS.

4. Methodologies exist for developing a “carbon budget” for fossil energy from federal lands.

We propose that the BLM develop a carbon budget for all fossil fuels produced from public lands, and derive from that analysis a coal-specific target.

As contemplated in the Federal Register notice announcing the preparation of the PEIS for the coal program, the BLM can better align leasing and production decisions with national climate change commitments by establishing (as a matter of policy) targets – a so-called “budget” – for the amount of federal coal production and desired additional leasing over a specified time period that would be consistent with current reduction targets. 81 Fed. Reg. at 17,727. This “budget” would effectively determine a production curve and leasing schedule that is consistent with U.S. climate goals and commitments, honors valid existing rights, and better anticipates the future market demand for coal in an increasingly carbon-constrained economy.

As discussed elsewhere in these comments, the BLM is clearly required to measure, evaluate and fully consider the GHG emissions and climate change impacts of the federal coal program in the PEIS based on a number of policies of the BLM and other agencies, and even the President. NEPA also requires the BLM to fully consider climate change issues in the PEIS. This analysis must inform BLM’s requirements to avoid, minimize and compensate for these impacts consistent with this country’s climate change commitments, specifically the requirement to reduce emissions by 26 to 28 percent below 2005 levels by 2025. This analysis and decision-

³⁶ See *id.* at 187-90.

³⁷ CEA 2016, Vulcan/ICF 2016, Erickson and Lazarus 2016, and Fulton, Kaplow, Capalino, and Grant 2016.

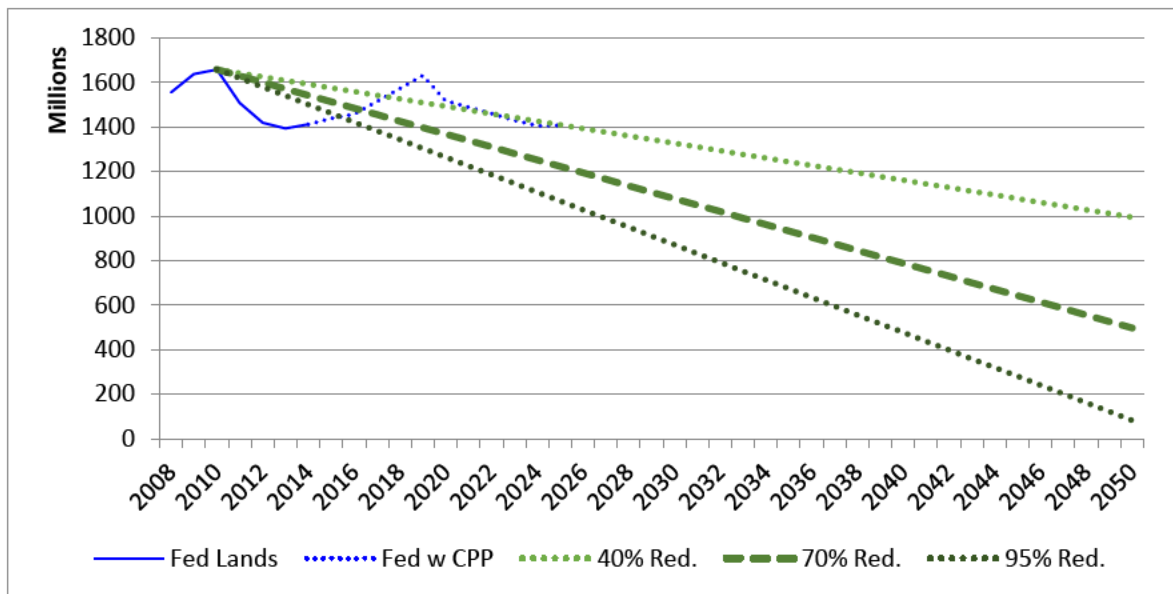
³⁸ 80 Fed. Reg. 64,662 (Oct. 23, 2015) (existing power plants); 80 Fed. Reg. 64,510 (Oct. 23, 2015) (new power plants); 77 Fed. Reg. 62,624 (Oct. 15, 2012) (light-duty vehicles); 76 Fed. Reg. 57,106 (Sept. 15, 2011) (medium- and heavy-duty vehicles).

making should seek to achieve a no more than 2 degrees C temperature increase, which will require the U.S. to reduce emissions an average of 70 to 80 percent below 2000 levels by 2050. This will require that a carbon budget be developed that limits carbon emissions from federal energy development to below 500m metric tons CO₂e by 2050.

Determining a “carbon budget” involves addressing a number of complicated factors including time horizon, target temperature, role of land use change, units, short-term climate pollutant emissions (like methane), aerosol emissions, climate sensitivity, and probability of success. Nevertheless, the approach is increasingly in use and a growing community of practice has demonstrated that such an approach is possible to calculate for federal lands.

For example, we at The Wilderness Society followed a common approach using publicly-available data.³⁹ We determined that that lifecycle federal emissions should be less than 500 million metric tons carbon dioxide equivalent (MTCO₂e) by 2050—which will require at least a 70 percent reduction in emissions from all fossil energy resources. Direct (sometimes called “upstream”) emissions must fall at least to 25 million MTCO₂e to stay within the “carbon budget” for public lands as a share of total U.S. national emissions.

Table 1: TWS Analysis of Federal Lifecycle CO₂e Compared to IPCC 2°C and 1.5°C Reduction Goals



We provide the results from our assessment of a “carbon budget” for federal lands to illustrate that such an exercise can be conducted with available data provided key assumptions are disclosed, and encourage BLM to prepare its own analysis utilizing a similar approach. From there, BLM can create a coal target based on coal’s projected future share of federal fossil energy

³⁹ This analysis will be detailed in a forthcoming whitepaper that presents our results, calculations, and highlights key assumptions and provides links to data elements. We will provide that information as supplemental comment and, as appropriate, incorporate it herein by reference.

production and/or CO₂e emissions.⁴⁰ We recommend the agency focus on simple scenarios, rather than complex models, to establish leasing targets based on a “carbon budget” analysis. A scenario-based approach was used by the Carbon Tracker Initiative in determining a critical input (future demand for Powder River Basin coal under a 2-degree scenario) used in their recent report reviewing the necessity of future federal coal leasing.⁴¹ This approach should be closely examined by the agency for potential use in establishing a coal production target under a fossil energy “carbon budget” for the Department. We will explore this and alternative methods more fully in our forthcoming whitepaper.

5. Incorporating budgets into a carbon management system.

We further recommend integrating the results of these analyses into a “carbon management system” at the Department-level for all fossil fuel energy including oil, gas and coal. A key element of this approach is tracking and disclosing emissions to measure progress and ensure accountability. And this system would also develop emissions reduction targets in accordance with national and international climate commitments as a basis for ensuring alignment, identifying new reduction opportunities and making future leasing determinations.

The carbon budget analysis serves as the basis for setting these targets, and would be used to inform decision making by the agency as part of a carbon management system. It could also be used when evaluating new policies, in NEPA processes or to dictate actual leasing decisions. While a carbon budget should be developed for all energy resources on federal lands, we believe that applying this concept to the coal leasing program is a logical starting point presented by the PEIS. The coal budget (measured in terms of CO₂e) will provide a target for the agency to stay below when making leasing decisions. The agency could consider how each new lease impacts the budget and, while a more robust system could be used to construct a firm limit or “hard cap” in the future, we recommend the budget be used to develop “soft targets” to guide decisions in the near term. Thus, we envision the coal budget playing an integral role in the agency’s determination of what, where and how much coal will be made available for lease. It should be incorporated into the proposed leasing process described in Section IV.H above.

6. Benefits of using a carbon management system.

This framework could provide great benefit for managers and stakeholders alike. A well-designed carbon management system based on a carbon budget for public lands would:

- Raise the profile of GHG emissions reductions within federal land management agencies responsible for overseeing development of public-owned energy assets by setting targets and creating accountability for making progress toward those targets;
- Enable development of a clear, sensibly devised emissions reduction profile for the long term which would provide direction and predictability to business and policy makers;
- Provide a structure for regular monitoring and review of targets;
- Underscore the necessity of accurate data and metrics based on strong science;

⁴⁰ This determination is based on scenario modeling and therefore will require the agency to be transparent with its methods.

⁴¹ Fulton 2016.

- Provide flexibility for achieving reductions in different aspects of federal land management over time.
- When used in conjunction with coal leasing, this could increase competition in the bidding process and incentive development of high potential/economically viable areas. It could also reduce the amount of speculative leasing and possibly lead to operators giving up leases they currently hold in low potential or economically unfavorable areas for alternative parcels.

7. Legal authority.

As discussed repeatedly in these comments, there is no doubt the BLM has the legal authority to pursue development of a coal budget and a carbon budget. This authority is provided under the MLA, FLPMA, and NEPA. These responsibilities are reiterated in the CEQ NEPA regulations as well as the BLM's federal coal regulations, as also discussed in numerous parts of these comments. A review of the most significant sources of this legal authority is set out in Section IX.A. and IX.B. of these comments. The BLM should recognize its authority—and indeed responsibility—and pursue development of a carbon budget and a coal budget.

8. Additional considerations.

We believe the carbon management system and coal budget are an important component of our overall recommendations for reducing the climate impacts from the federal coal program through this reform. That said, we understand that questions may arise regarding implementation of our recommendations - most importantly, the question of how compensatory mitigation might impact the budget.

As described above, the goals of the coal budget are to track and ultimately reduce emissions from the coal program to ensure that it is consistent with national climate goals and policies. The issue some might raise is that under our budget proposal, a new coal lease and the associated CO_{2e} emissions would count against the overall budget, which again, in and of itself, is intended to reduce climate impacts; at the same time, we propose compensatory mitigation requirements for new leases that may include offsets for greenhouse gas emissions and/or actions to support adaptation for the climate change impacts caused by the increased emissions.

In order to address this, it is important to understand how the budget interacts with the mitigation hierarchy. The hierarchy consists of avoidance, minimization and offsets/compensatory mitigation; the hierarchy must be pursued in that order to address potential impacts from a particular action (*See* Sections V and VI.F for additional discussion of mitigation in the broader context of the PEIS).

The carbon budget should be thought of as an avoidance mechanism or strategy. The goal of the budget is to reduce or “avoid” greenhouse gas emissions. In other words, individual actions or decisions, like the decision to lease additional coal, should always count against the budget because the budget in and of itself is part of the agency's strategy for reducing greenhouse gas emissions from the federal coal program.

This approach will also allow BLM track all emissions under the carbon/coal budget for inventory and recordkeeping purposes. Meaning regardless of compensatory mitigation, the agency can keep an emissions inventory showing total potential CO₂e emissions from producing, existing and new leases.

In addition to tracking and managing towards the overall coal emissions budget when considering new leases, the BLM should also require compensatory mitigation for new leases to address their specific impacts, including greenhouse gas emissions and associated climate change impacts. This approach is analogous to BLM's approach to mitigation under the sage grouse plans. There, the agency established regional surface disturbance caps and requirements that developers demonstrate a net benefit to grouse populations through implementation of compensatory mitigation. Under the grouse plans, while BLM may authorize impacts in areas that have not exceeded the disturbance cap, those impacts count against the cap *and* mitigation for the impacts is still required to demonstrate a net benefit to grouse. A similar approach is appropriate here.

Recommendations: BLM should develop a carbon budget and carbon management system for fossil fuels on public lands modeled after the analysis done by The Wilderness Society. Using the carbon budget, BLM should create a coal budget that will be used as a soft target and decision making tool. The budgets and carbon management system should play an integral role in the leasing process as proposed in Section IV.H. When considering new leases BLM should measure and manage toward the budget as well as requiring compensatory mitigation for the GHG emissions and climate change impacts new leases would cause.

E. BLM Must Ensure that the PEIS Addresses Mitigation for Climate Impacts Consistent with all Relevant Laws and Policies, including Current Mitigation Guidance

1. Consistent with the mitigation hierarchy, BLM must avoid, minimize and mitigate impacts from the federal coal program, including climate change impacts.

As discussed above, BLM has significant obligations and authority related to mitigation. Mitigating climate-related impacts includes avoiding and minimizing generation of GHG emissions, including protecting intact lands and applying management prescriptions to reduce emissions and harm to carbon sinks. However, there are acknowledged, serious and unavoidable climate impacts for the United States and the entire planet from the federal coal program, including upstream impacts from coal exploration and development and downstream impacts from coal transportation and combustion. The full lifecycle GHG emissions from federal coal accounted for 10 percent of the total U.S. GHG emissions in 2012.

In addition to the legal and policy direction that requires mitigation for climate impacts from the federal coal program and provide the agency with ample discretion to require mitigation, it is important to underscore that as a land manager, the federal government is facing huge and rapidly escalating costs to address the impacts caused by fossil-fuel driven climate change. Forest fires, widespread drought, rising sea levels, spread of invasive species and spread of disease already result in significant costs to the federal government, and each new coal lease the BLM authorizes increases these problems and the associated costs. Research from the University

of Vermont's Gund Institute for Ecological Economics and The Wilderness Society suggests that total costs in degraded ecosystem services could exceed \$14.5 billion annually under a 2-degree C warming scenario.⁴² These costs are ultimately borne by all American taxpayers, and BLM has a responsibility to recoup these costs when it makes decisions authorizing activities that directly cause these impacts and associated costs.

2. The programmatic nature of the Coal PEIS makes it the appropriate place to analyze and set up a framework to address climate impacts through mitigation.

Despite the clear requirements (discussed in detail above) that BLM analyze climate impacts from its decisions, BLM has to-date mostly failed to complete such analyses, arguing that, "... because the current state of climate science prevents the association of specific actions with specific climate-related effects, the BLM can neither: (a) Analyze the climate-related effects of BLM actions nor (b) Ascribe any significance to these potential effects." See, e.g., BLM Presentation *Incorporating Climate Change into BLM Planning and NEPA Processes*.⁴³ The agency has pointed to⁴⁴ CEQ's Draft Guidance emphasizes the "rule of reason" which, "... ensures that agencies are afforded the discretion, based on their expertise and experience, to determine whether and to what extent to prepare an analysis based on the availability of information, the usefulness of that information to the decision-making process and the public, **and the extent of the anticipated environmental consequences.**" CEQ Draft Guidance, page 5 (emphasis added). In particular, BLM has pointed to instruction in the Draft Guidance with regard to the extent of the anticipated environmental consequences directing agencies to "... consider both the context and the intensity." CEQ Draft Guidance, page 10.

This argument is specious at best and, as discussed above, has been rejected by the CEQ in its Climate Change NEPA Guidance report and increasingly by the courts. As detailed above, BLM is required to analyze these effects. There are existing, widely available science-based tools for doing so. And the GHG emissions and climate impacts from individual coal can and must be measured, and then commensurate mitigation actions taken. Moreover, the Draft Guidance clearly states that, "[i]t is essential . . . that federal agencies not rely on boilerplate text to avoid meaningful analysis, including consideration of alternatives or mitigation."

Regardless, because of the anticipated environmental consequences resulting from the entirety of the federal coal leasing program for the duration of the study period, the Coal PEIS is both an appropriate vehicle and a necessary context in which to analyze these emissions, and design a

⁴² See Esposito, Valerie; Phillips, Spencer; Boumans, Roelof; Moulaert, Azur; Boggs, Jennifer. 2011. "Climate change and ecosystem services: The contribution of and impacts on federal public lands in the United States." In: Watson, Alan; Murrieta-Saldivar, Joaquin; McBride, Brooke, comps. *Science and stewardship to protect and sustain wilderness values: Ninth World Wilderness Congress symposium*; November 6-13, 2009; Merida, Yucatan, Mexico. Proceedings RMRS-P-64. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. p. 155-164. Available at http://www.fs.fed.us/rm/pubs/rmrs_p064.pdf? (accessed July 23, 2016).

⁴³ Available at:

http://www.blm.gov/style/medialib/blm/wo/Planning_and_Renewable_Resources/presentations.Par.2279.File.pdf/Incorporating_Climate_Change_into_Planning_and_NEPA_Documents.pdf

⁴⁴ E.g., see BLM Protest Resolution notification 3100 (MT9221.AG), April 18, 2016. Available at http://www.blm.gov/style/medialib/blm/mt/blm_programs/energy/oil_and_gas/leasing/lease_sales/2016/may4_2016.Par.26452.File.dat/May%204%202016%20protest%20response%20%204-18-2016.pdf (accessed July 24, 2016).

framework for addressing mitigation. As discussed above, the programmatic nature of this PEIS makes it even more appropriate and important for BLM to measure and address these impacts as part of the PEIS. Though GHG emissions and climate impacts from individual coal leases may be small, their cumulative impacts are enormous, with full lifecycle emissions accounting for ten percent of all US GHG emissions. While downstream emissions, from use of coal, may be more attenuated than upstream emissions from exploration and production, BLM can and should evaluate and estimate these impacts, then develop commensurate mitigation requirements.

3. BLM should develop a compensatory mitigation framework for addressing unavoidable climate impacts in its draft alternatives.

For unavoidable climate change impacts associated with leasing and development of coal resources, BLM should develop a framework in the PEIS that can be used for the entire program. We will be releasing a longer whitepaper going into greater detail on key design considerations and operational elements in August 2016 and will provide as supplemental comment. In the meantime, this letter spells out the basic framework.

To establish this framework, BLM must quantify through the PEIS the GHG emissions using the tools described in Section VI.C, and analyze the climate impacts associated with these GHG emissions using the tools described in Section VI.D.

The BLM should establish in the Record of Decision as a matter of policy that the agency will require compensatory mitigation to offset the climate impacts of federal coal leasing and production. The same tools should be required to be used for future lease-level analysis with guidance for field staff on how to apply them. The estimated impacts resulting from the analysis represent unavoidable climate impacts that should be addressed through compensatory mitigation.

As part of the compensatory mitigation policy, the BLM should initiate a regional mitigation strategy/plan for key coal leasing areas that addresses all impacts include climate. BLM should consider several key design features that should be spelled out in the ROD:

- *BLM should consider compensatory mitigation actions that offset the climate impacts associated with the emissions attributable to the leased coal in question, and that offset the carbon emissions themselves.*

Quantifying impacts is becoming increasingly more practical, and the science connecting impacts to temperature changes increasingly more precise. The practice of arriving at a mitigation fee at a lease level can be challenging, but real harm will be felt by human and natural communities. Compensatory mitigation funds can be directed at enhancing the adaptive capacity of human and natural communities in the affected landscape to improve their health and resilience in the face of expected change. Offsetting actions can include investments in land protection, restoration or rehabilitation. They can also include payments to communities to assist with a transition away from coal-dependent regional economy.

Significant opportunity also exists to offset the GHG emissions themselves. EPA has repeatedly urged land management agencies to assess carbon offsets in EAs and EISs as a way to reduce

climate change impacts of agency actions. EPA has specifically noted that offsets are a reasonable alternative to lessen the impacts of coal mine methane emissions. In a 2007 letter concerning a proposal to permit MDWs at the West Elk Mine, EPA specifically rejected the Forest Service’s assertion that a carbon offset alternative was not reasonable: “[I]t is reasonable to consider offset mitigation for the release of methane, as appropriate. Acquiring offsets to counter the greenhouse gas impacts of a particular project is something that *thousands of organizations, including private corporations, are doing today.*”⁴⁵ EPA specifically recommended that the Forest Service’s Lease Modifications EIS “acknowledge that revenues for carbon credits are available via several existing markets.”⁴⁶ Similarly, EPA has recommended that a Forest Service NEPA analysis of a forest health project “discuss reasonable alternatives and/or potential means to mitigate *or offset* the GHG emissions from the action.”⁴⁷ Numerous state agencies already use offsets to control GHG emissions.⁴⁸ Offsets can include participation in third-party offset markets or renewable energy credits.

The potential for federal participation in an offsets program is well demonstrated by actions that have been taken relative to emissions from the Navajo Generating Station in Arizona to comply with Clean Air Act requirements pursuant to EPA’s regional haze rules. There, in agreement with state, federal, tribal and NGO participants, the DOI has committed to reduce or offset federal carbon dioxide emissions by three percent annually for a total of 11.3 million metric tons of emissions reductions by the end of 2031.⁴⁹ This is intended to reduce carbon dioxide emissions and demonstrate the workability of a credit-based system to achieve carbon dioxide emission reductions. In addition, the DOI has committed to facilitating development of Clean Energy Projects intended to achieve eighty percent generation of clean energy for the federal share at the Navajo Generating Station by 2035 by securing over twenty-six million megawatt hours in Clean Energy Development Credits.⁵⁰

Knowing that not every option may be available in all instances, the BLM should specify the priority order for investment amongst the several options. We recommend every effort be taken to offset the carbon emissions from the coal program.

- *BLM should attempt to address the full scope of lifecycle emissions through compensatory mitigation – that is, production, transport and combustion.*

The premise of compensatory mitigation is to address unavoidable harm. In the case of federal coal, the harm is significant and primarily attributable to end-use combustion. The BLM should

⁴⁵ Letter of L. Svoboda, EPA to C. Richmond, Forest Service (Aug. 7, 2007) at 7 (emphasis added).

⁴⁶ EPA July 2012 Comment Letter (Ex. 29) at 5 (identifying four U.S. carbon exchanges creating a market for carbon credits).

⁴⁷ Letter of L. Svoboda, EPA, to T. Malecek, USFS, at 8 (Oct. 27, 2010).

⁴⁸ See, e.g., Settlement Agreement, ConocoPhillips and California (Sept. 10, 2007) (California agency requiring offsets as a condition of approving a project), attached as Ex. 46; Minn. Stat. § 216H.03 subd. 4(b) (Minnesota law requiring offsets for certain new coal-fired power plants); Me. Rev. Stat. Ann. tit. 38, § 580-B(4)(c) (Maine law establishing greenhouse gas initiative that includes the use of carbon offsets).

⁴⁹ See https://www.doi.gov/sites/doi.gov/files/migrated/upload/7-25-2013-NGS-TWG-Agreement-FINAL_Executed.pdf (presenting the Technical Work Group Agreement Related to Navajo Generating Station (NGS)).

⁵⁰ *Id.*

make every effort to address this but at least establish a regime capable of addressing the direct emissions that could be avoided or minimized by regulatory action.

- *BLM should specify whether compensatory mitigation should be paid on an annual basis or paid up front.*

In lieu fees collected for compensatory mitigation are often paid in lump sum at the beginning of a project's operational life. In the case of climate impacts, it may make more sense to consider an annual payment on the basis of production, or an annualized payment schedule based on expected production with corrections on a semi-annual basis. By spreading payments over the life of the project (and tying them to when the impacts actually occur), the system should be both fairer to producers and truer to the spirit of mitigation.

- *BLM must ensure mitigation actions are additional—that is, result in actions that add real, verifiable carbon savings or other benefit—and durable—that is, the conservation benefit lasts for at least a period of time commensurate with the duration of the impact itself.*

This is an established principle for the Department's approach to mitigation but is particularly important with regard to climate impacts. For example, the Australian Government's Climate Change Authority found that, "Assessing additionality is a key feature of all baseline and credit schemes. An additionality test assesses whether a project or activity creates 'additional' emissions reduction that would not have occurred in the absence of the incentive. The baseline for the project assesses how much emissions have been reduced. Additionality is important to ensure that a baseline and credit scheme does not pay for emissions reductions that would have occurred anyway."⁵¹

- *BLM should specify when mitigation terms apply to existing leases.*

Mitigation terms should be applied as broadly and comprehensively as possible. With regard to climate impacts, so much coal is under lease that simply limiting a compensatory mitigation approach to future new leasing will do little to address the climate harms known to result from leasing and production of federal coal. The BLM should look at a transparent and fair method to incorporate these requirements when significant modifications are sought for existing leases, as well as ensuring new leases include these provisions.

F. BLM Should Evaluate Addressing Externalities Associated with Carbon Emissions Resulting from Leasing and Production of Federal Coal Through Royalty Rates or Additional Fees.

Another approach to managing the carbon emissions associated with the Federal Coal Program is by addressing the costs borne by society due to federal coal leasing and production through economic tools designed to ensure that taxpayers receive a fair return. Referred to by some as a

⁵¹ See <http://www.climatechangeauthority.gov.au/reviews/carbon-farming-initiative-study/additionality>

carbon adder, such an approach increases the price paid to the federal government for the use of federal coal to reflect some or all of its climate costs (*i.e.*, climate externality).⁵² Some have argued that such an adder could be incorporated into the existing bonus bid, rents, or royalty paid on federal coal sales because it offers the administratively simplest and most efficient strategy, and because of the potential for states and communities impacted by reductions in coal mining to receive a portion revenue generated by the adder even as coal production declines.⁵³ An adder could be set at a price to address emissions associated with lifecycle emissions of federal coal or just the direct (upstream) emissions of from coal mining.⁵⁴ Fully incorporating the lifecycle costs would potentially result in a very large price increase, but could be phased in.⁵⁵ Another approach would be for DOI to initially apply an upstream (direct) carbon adder for all fossil production, including coal, as part of the royalty rate. In a forthcoming paper, we will demonstrate in more detail how this approach has myriad benefits, including market flexibility so that least cost options will be made, clearly under the purview of DOI and BLM, more straightforward and transparent than a lifecycle cost, increases taxpayer fairness by beginning to internalize externalities and increasing state and federal revenue, is complimentary to leasing reform. Lastly, “The statutory case for a BLM coal pricing initiative appears to be stronger than the case against it since BLM is required to consider the environment when making multiple use decisions for public land. BLM’s leasing statutes also appear to afford the agency a significant amount of discretion to set the financial terms of coal leases.”⁵⁶

Recommendations: BLM should consider adjusting bonus bids, rents, and royalties to address the associated externalities (a so-called “carbon adder”) as a pathway to meeting its goals to reduce climate emissions from the federal coal program consistent with national climate commitments.

G. BLM Can Also Directly Regulate Climate Emissions.

BLM also has the authority—and we believe the obligation—to reduce climate emissions from the federal coal program through regulation. The PEIS should examine and advance regulations to reduce the emissions of methane and other greenhouse gases from coal mining operations. BLM has already taken steps in this direction with an advance notice of proposed rulemaking to regulate methane that is released as a direct results of mining operations, known as waste mine

⁵² A.J. Krupnick et al., “Putting a Carbon Charge on Federal Coal: Legal and Economic Issues”, Resources for the Future Discussion Paper 15--13, 2015, Washington, DC: RFF. Available at <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-15-13.pdf>. Last accessed, July 22, 2016.

⁵³ Krupnick et al.; T. Gerarden, W. Spencer Reeder, and J. Stock, “Federal Coal Program Reform, the Clean Power Plan, and the Interaction of Upstream and Downstream Climate Policies,” April 2016. Available at http://scholar.harvard.edu/files/stock/files/fedcoal_cpp_v9.pdf. Last accessed July 22, 2016. Note that under existing law, the government’s authority to share revenue collected from federal coal leasing and production is limited. See Baldwin, Pamela. 2010. “Fair Market Value for Wind and Solar Development on Public Land.” Whitepaper commissioned by The Wilderness Society and Taxpayers for Common Sense. Pages 21-24. Available at <https://wilderness.org/sites/default/files/Fair-Market-Value-Whitepaper.pdf> (accessed July 26, 2016).

⁵⁴ For an in-depth look at the distinction between lifecycle and direct (upstream) emissions, see Burger, Michael and Wentz, Jessica. 2016. “Downstream and Upstream Greenhouse Gas Emissions: The Proper Scope of NEPA Review.” Forthcoming working paper.

⁵⁵ Krupnick et al.

⁵⁶ Krupnick, et al. p. 3.

methane. BLM should move forward with the Coal Mine Waste rule and, through the PEIS, examine other rules to reduce greenhouse gas emissions from coal mining operations.

1. Reducing methane emissions from public lands is important.

According to BLM, emissions of methane make up nearly nine percent of all the greenhouse gas emitted as a result of human activities in the United States. Since 1990, methane pollution in the United States has decreased by eleven percent, even as activities that can produce methane have increased. However, methane pollution is projected to increase to a level equivalent to over 620 million tons of carbon dioxide pollution in 2030 absent additional action to reduce emissions. BLM recognized that “[r]educing methane emissions is a powerful way to take action on climate change.”⁵⁷ Although methane emissions from coal mines account for only about 6.3 percent of the total lifecycle emissions for coal used to produce electricity,⁵⁸ an analysis by The Wilderness Society suggests that implementation of the Mine Methane Waste Rule could reduce direct emissions from the federal coal program by an estimated 2.4 million MT_{CO2e}.⁵⁹

2. BLM has the authority to regulate methane emissions from coal mining.

In 2014, the BLM issued an Advance Notice of Proposed Rulemaking to reduce methane from mining operations on public lands.⁶⁰ BLM cited its authority for regulation methane waste: “The authority for the BLM to address the capture, use, or destruction of waste mine methane across 700 million acres of Federal mineral estate comes from the Mineral Leasing Act.”

The ANPR also recognizes that methane is emitted “not only from underground coal mines, but also from active surface coal mines and post-mining operations, as well as abandoned or closed underground coal mines.”⁶¹ BLM should consider regulations to reduce emissions from these sources as well.

Recommendations: The BLM should examine and advance regulations to reduce the emissions of methane and other greenhouse gases from coal mining operations, both underground and surface operations. Unless and until those regulations are complete, the BLM should immediately consider other options to offset these emissions or otherwise address the associated climate impacts.

⁵⁷ From BLM to Examine Steps to Reduce Methane from Mining Operations on Public Lands, at http://www.blm.gov/ut/st/en/info/newsroom/2014/april/blm_to_examine_steps.html.

⁵⁸ Whitaker et al., Harmonization of Coal Life Cycle GHG Emissions, Yale University, 2012. <http://onlinelibrary.wiley.com/doi/10.1111/j.1530-9290.2012.00465.x/pdf>

⁵⁹ Ratledge, Nathan. Unpublished analysis of carbon emissions reduction potential of current and proposed rules at the Department of the Interior and related agencies. October 2015. Available upon request.

⁶⁰ Waste Mine Methane Capture, Use, Sale, or Destruction, A Proposed Rule by the Bureau of Land Management on April 29, 2014, 79 FR 23923, RIN 1004-AE23. <https://www.federalregister.gov/articles/2014/04/29/2014-09688/waste-mine-methane-capture-use-sale-or-destruction>.

⁶¹ *Id.*

VII. BLM SHOULD CONSIDER A ROBUST RANGE OF ALTERNATIVES TO ADDRESS THE COMPLEX CONSIDERATIONS IN THE PEIS.

A. BLM Should Develop a Broad Range of Alternatives That Considers Avoiding Environmental Harm and Supporting Conservation.

The range of alternatives is “the heart of the environmental impact statement.” 40 C.F.R. § 1502.14. NEPA requires BLM to “rigorously explore and objectively evaluate” a range of alternatives to proposed federal actions. *See* 40 C.F.R. §§ 1502.14(a) and 1508.25(c).

NEPA’s requirement that alternatives be studied, developed, and described both guides the substance of environmental decision-making and provides evidence that the mandated decision-making process has actually taken place. Informed and meaningful consideration of alternatives -- including the no action alternative -- is thus an integral part of the statutory scheme.

Bob Marshall Alliance v. Hodel, 852 F.2d 1223, 1228 (9th Cir. 1988), *cert. denied*, 489 U.S. 1066 (1989) (citations and emphasis omitted).

An agency violates NEPA by failing to “rigorously explore and objectively evaluate all reasonable alternatives” to the proposed action. *City of Tenakee Springs v. Clough*, 915 F.2d 1308, 1310 (9th Cir. 1990) (quoting 40 C.F.R. § 1502.14). This evaluation extends to considering more environmentally protective alternatives and mitigation measures. *See, e.g., Kootenai Tribe of Idaho v. Veneman*, 313 F.3d 1094, 1122-1123 (9th Cir. 2002) (and cases cited therein); *see also Env’t Defense Fund., Inc. v. U.S. Army Corps. of Eng’rs*, 492 F.2d 1123, 1135 (5th Cir. 1974); *City of New York v. Dept. of Transp.*, 715 F.2d 732, 743 (2nd Cir. 1983) (NEPA’s requirement for consideration of a range of alternatives is intended to prevent the EIS from becoming “a foreordained formality.”); *Utahns for Better Transportation v. U.S. Dept. of Transp.*, 305 F.3d 1152 (10th Cir. 2002), *modified in part on other grounds*, 319 F.3d 1207 (2003); *Or. Env’tl. Council v. Kunzman*, 614 F.Supp. 657, 659-660 (D. Or. 1985) (stating that the alternatives that must be considered under NEPA are those that would “avoid or minimize” adverse environmental effects).

In recent cases, courts have found NEPA violations based on an agency’s failure to evaluate a conservation-oriented alternative. *See, e.g., New Mexico v. BLM*, 565 F.3d 683, 710-711 (10th Cir. 2009) (Alternative considering closing Otero Mesa to oil and gas leasing must be considered as part of oil and gas amendment to governing land use plan); *Colorado Environmental Coalition v. Salazar*, 875 F.Supp.2d 1233, 1249-1250 (D.Colo. 2012) (BLM required to consider community alternative protecting Roan Plateau from surface disturbance). Accordingly, the BLM should consider a range of alternatives that includes protecting other resources and values in developing alternatives in the Coal PEIS.

Further, the BLM should fully evaluate a true range of alternatives, rather than setting up alternatives that are at far ends of a spectrum with one “compromise.” An agency violates its obligation to consider a reasonable range of alternatives and to take NEPA’s hard look at environmental impacts when it only looks at “straw men” for comparison, which the agency has

no intention of accepting and are put forth only to lead to the agency's already foregone conclusion. *See, e.g., California v. Block*, 690 F.2d 753 (9th Cir. 1982); *Blue Mountains Diversity Project v. U.S. Forest Service*, 229 F.Supp.2d 1140 (D.Or. 2002); *Oregon Natural Desert Association v. Singleton*, 47 F.Supp.2d 1182 (D.Or. 1998). In the context of the Coal PEIS, there are a variety of issues to be addressed and tools to be considered that merit a range of alternatives that is both broad in terms of options and deep in terms of the level of analysis completed. This will provide the agency with a thorough range of options from which to develop its final PEIS.

B. BLM Should Evaluate a Range of Tools to Achieve Climate Goals.

A goal of the PEIS is to reduce climate emissions from the federal coal program consistent with national climate commitments. To achieve that goal, the BLM should establish a reduction target for public lands of at least 70% by 2050 and create a measurement protocol for federal lands emissions, regularly disclosing progress towards meeting that target and developing new policies that yield reductions. There are several policy pathways that lead towards meeting this goal, which can be applied in a manner that is fair, efficient and consistent with existing laws, as discussed in detail above. A range of alternatives will give the agency the opportunity to evaluate a variety of approaches and ultimately incorporate the best elements into this final PEIS.

Consequently, we recommend that BLM develop alternatives that evaluate the suite of policies that could be used to meet climate goals, including:

- Incorporating a carbon adder into the royalty rate for coal. While measurement and assessment of impacts from upstream emissions (from exploration and production) may be easier to quantify and downstream emissions (from transportation and combustion) may be more challenging because they are more attenuated, a carbon adder may be useful in one or both contexts by offering a straightforward approach and a mechanism to direct funding directly to states and local communities.
- Developing and applying mitigation measures consistent with the mitigation hierarchy, including compensatory mitigation requirements to offset climate impacts.
- Developing a carbon budget and management framework for all fossil fuels developed on federal lands that includes a targeted budget for coal. The budget should inform decisions made by the agency and could be used as a cap to limit future coal sales.
- Incorporating a range of tools to measure carbon emissions and impacts from those emissions, including those discussed above and others that may be under development.

C. BLM Should Evaluate a Range of Approaches to Meet Other Goals of Reforming the Coal Program.

In addition to a range of alternatives that includes a focus on reducing environmental impacts and methods to meet climate goals, BLM should evaluate a range of alternatives to meet the other goals of the PEIS, including;

- Developing a regional mitigation strategy for the Coal PEIS and/or developing regional mitigation strategies that are focused on high priority areas.

- Amending all affected plans or amending a set of priority plans where ongoing development and risks to communities are highest and setting up an approach for remaining plans.
- Incorporating transition approaches for affected communities that can be a set of common elements or tailored to specific regions or communities, or simply setting out priority areas where transition will be addressed.
- Evaluating use of royalty rates or mitigation or a combination thereof to address impacts to resources and communities.
- Eliminating LBA or incorporating LBA into a more proactively managed regional leasing program.
- Identifying opportunities to incentivize competition, which could include bidding on a set Btu of coal, or determining what role competition can play in other ways.
- Including a range of tools to ensure a fair return to taxpayers from the federal coal program. At a minimum this means identifying and ensuring fair market value for coal produced. It also includes evaluating the other public benefits that would be gained from contracting the coal program and considering whether and how royalty rates, bonding amounts and reclamation standards should be adjusted.

D. A Preliminary Range of Alternatives Should Be Set out in BLM’s Scoping Report, along with an Initial Purpose and Need.

An initial version of the broad range of alternatives should be defined in the report BLM will be producing regarding the scoping process and information gained to date. The scoping process will help to define the range of alternatives under consideration and these initial conclusions should be presented to the public. Similarly, the report can set out the agency’s initial approach to the purpose and need for the PEIS, which is a vital part of defining the range of alternatives.

Recommendations: Through this PEIS, the BLM can and should protect natural and cultural values through various management decisions, including by excluding or limiting certain uses of the public lands. *See*, 43 U.S.C. § 1712(e). Incorporating a robust range of alternatives to address the significant set of issues impacted by the Coal PEIS will require evaluating opportunities and tools to protect other resources, meet climate goals, and improve the fair return of the program as a whole. Setting out an initial purpose and need and range of alternatives in the scoping report will ensure that both the agency and stakeholders get the most benefit from the information provided through the scoping process. Developing a range of alternatives with sufficient breadth and depth will provide the best opportunities to arrive at the most effective set of reforms for the federal coal program.

VIII. PLANNING FOR A FUTURE WITH DECLINING COAL PRODUCTION.

Communities that are largely dependent on mining publicly-owned coal are already feeling the impacts of structural changes in the coal industry. Compared to 2008, coal production in the Powder River Basin was down by 19 percent in 2015, a decrease of nearly one-fifth in just eight years. Across EIA’s Western Region, where most federally-owned coal is located, over the same period coal mining jobs went from 15,177 down to 14,100, a seven percent decrease. Colorado

has lost roughly 320 coal mining jobs since January 2015, or 20 percent of jobs at mines.⁶² Workers and their families have borne the brunt of these changes, losing jobs, facing unmet healthcare needs and dealing with the emotional impacts of suffering dramatic changes to their lives and those of their neighbors.

Going forward, coal-dependent communities in the West will continue to experience declines in employment and revenue. EIA's *Annual Energy Outlook 2016* (AEO2016) reference case projects that coal production in the Western Region will fall by 155 million tons between 2015 and 2040.⁶³ These changes have occurred without any significant new policies or regulations specific to the federal coal program, driven by gains in productivity and loss of market share to natural gas and renewable energy.

The federal coal program should help communities become more resilient to the accelerating changes in the coal sector. A significant part of federal coal program reform and the PEIS should include taking action to address current job losses and mine closures and create more resilient economies in future.

A. Coal-dependent Communities.

In the West, some 45 mines with federal coal leases are spread across 27 counties in seven states.⁶⁴ The degree to which different counties and communities depend on coal varies, but all are reliant on coal mining for jobs, taxes, and federal royalties to a significant extent. Counties where coal-fired power plants are located at the mouth of the coal mine or where coal mines supply coal to only one nearby power plant are more economically dependent on the coal industry. Prime examples include Moffat and Routt Counties in Colorado, Emery County in Utah, and Campbell, Lincoln, and Sweetwater Counties in Wyoming.⁶⁵

B. Socio-economic Analysis Is Needed.

As part of the PEIS, the BLM should look carefully at each county where federal coal plays a significant role in the local economy to understand the past, current and future economic and social impacts of the coal mining and associated power plants. This analysis should serve as the basis for designing measures to help communities plan for a future with declining coal extraction and energy generation.

As BLM reviews socio-economic impacts of federal coal leasing and development, it should consider the positive *and* negative impacts of continued economic reliance of local communities

⁶² Colorado Division of Reclamation, Mining and Safety Monthly Coal Summary Reports, <http://mining.state.co.us/Reports/Reports/Pages/Coal.aspx>. Last accessed July 26, 2016. See also, <http://www.denverpost.com/2016/05/14/collapse-of-colorado-coal-industry-leaves-mining-towns-unsure-whats-next/>.

⁶³ <http://www.eia.gov/todayinenergy/detail.cfm?id=26992>

⁶⁴ Colorado, 7 counties; Montana, 5 counties; North Dakota, 4 counties; New Mexico, 2 counties; Utah, 3 counties; Washington, 1 county; Wyoming, 5 counties. Based on data from MSHA BLM Coal Mine Crosswalk Feb. 3, 2015. Pers. Comm. From Mark Haggerty, Headwaters Economics, July 15, 2016.

⁶⁵ Form EIA-923 detailed data, <https://www.eia.gov/electricity/data/eia923/>. Last accessed, July 22, 2016.

on coal extraction. Some research has shown that dependence on coal adversely affects non-coal employment in places like Appalachia.⁶⁶ They found that high levels of coal employment are associated with lower levels of entrepreneurship and higher levels of migration out of Appalachian regions as coal crowds out other types of businesses. Prolonging coal employment may actually slow the transition to other economic activities and reduce long-term economic growth.

C. Transition Planning and Programs Should Be Assessed in the PEIS.

BLM can and should help communities plan for the future through the PEIS. BLM should both provide analysis of current and projected economic conditions *and* put in place programs that can help with coal-dependent economies become more resilient to changing conditions. BLM's efforts should include the following:

Support communities' creation of impact mitigation plans. Given the relatively small number of counties and communities engaged in mining of federal coal, BLM should work with communities to conduct analyses of the socio-economic characteristics of each county in which federal coal is mined. BLM should, among other things, use the Economical Profile System (EPS) and produce detailed socioeconomic profiles.⁶⁷ BLM should incorporate best practices for social impact assessment, including involving potentially affected publics and developing mitigation plans.⁶⁸ BLM could incorporate transition approaches for affected communities both in the PEIS and through targeted RMP amendments or revisions for areas with current mining operations.

Identify mechanisms through which the Department of the Interior can assist communities become stronger and more resilient in the face of rapidly changing economic conditions.

Use mitigation planning and funding. In section VI. G., we recommend that BLM implement a comprehensive mitigation program that could provide both financial resources and job opportunities to local communities to address the impacts of coal mining and climate change. In that section, we argue that BLM should evaluate mechanisms that would allow communities to share in revenue generated by efforts to capture environmental externalities in the cost of federal coal, whether through efforts to address compensatory mitigation or a carbon adder. The BLM should explore every opportunity to ensure financial and other resources are made available to assist in repositioning resource-dependent communities to succeed in the next energy economy.

Develop a program to hire mine workers for restoration and rehabilitation beyond the mine site. BLM should also propose a program to employ the skills of mine workers in restoration and rehabilitation of public lands, aimed at both improving resilience of public lands in the face of climate change and their ability to mitigate climate change through biological sequestration.

⁶⁶ [Michael R. Betz](#), [Mark D. Partridge](#), [Michael Farren](#), [Linda Lobao](#), Coal mining, economic development, and the natural resources curse, [Energy Economics](#), Volume 50, July 2015, Pages 105–116.

⁶⁷ <http://headwaterseconomics.org/tools/economic-profile-system/about/>. Last accessed, July 24, 2016

⁶⁸ Jeffrey B. Jacquet, Ph.D., A Short History of Social Impact Assessment, November, 2014.

http://headwaterseconomics.org/wphw/wp-content/uploads/Energy_Monitoring_SocialImpacts_History.pdf

Over the last several decades, the federal government has invested in programs to address job losses and improve environmental conditions in local areas. BLM should look to, learn from, and improve upon past examples like the watershed restoration and the “Jobs-in-the-Woods Program” from the 1990s and its contemporary incarnations.⁶⁹

Explore changes to revenue sharing statutes to improve community access to funding for local schools and other community priorities. Headwaters Economics and others have proposed changing the formula through which the federal Payments in Lieu of Taxes (PILT) program functions so that the size and relative distribution of federal payments to counties is less directly tied to the specific source of revenue. This would create a framework that can accommodate new dedicated funding streams from public lands from various sources, such as increased fossil fuel royalties, new leasing fees or a carbon tax.⁷⁰ It could also provide more stable funding for local schools in vulnerable communities. Though such an approach would require federal legislation, the PEIS could propose and analyze such an option.

Help communities understand the likely future. As outlined in section IV.I. above, BLM needs to provide an updated “base case” and reasonably foreseeable development scenario for the federal coal program. Such an analysis should include information about expected retirement for coal fired power plants, status of proposed/announced coal mining projects, availability (or lack thereof) of capital for coal mining projects, employment trends, local government revenue sources, and other key factors. It is important for communities to have a realistic understanding of the likely future of the coal industry generally and the market their mines supply specifically.

Provide communities a comprehensive review of tools to help diversify their economies.

This has been helpful for coal-dependent communities—across the country and specifically in the West—to support worker transition and to help communities retooling their economies to become more resilient to changing conditions. These tools include programs targeted at workers and their families to address economic security (such as job retraining programs⁷¹, ensuring health and retirement security), local government (such as providing local infrastructure⁷²), rural

⁶⁹ Christopher E. DeForest, 1999. Watershed restoration, jobs-in-the woods, and community assistance: Redwood National Park and the Northwest Forest Plan. Gen. Tech. Rep. PNW-GTR-449. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 31 p.

http://www.fs.fed.us/pnw/pubs/pnw_gtr449.pdf. Last accessed, July 26, 2016. See also, Ecotrust, “Investing in natural assets for the benefit of communities and salmon” brochure, <http://www.ecotrust.org/media/WWRI-Restoration-Economy-Brochure.pdf> describing current economic benefits of restoration for Oregon communities.

⁷⁰ Testimony of Mark Haggerty, Headwaters Economics March 19, 2013, Senate Energy and Natural Resources Committee Hearing on PILT and SRS Reauthorization and Reform. http://www.energy.senate.gov/public/index.cfm/files/serve?File_id=4cf8ec04-5477-4c03-87f5-b0eb29ea6e26. Last accessed July 24, 2016.

⁷¹ Such as retaining programs in Kentucky (<http://www.jobsight.org/jobseeker/coalminers>) and West Virginia (<http://workforcewv.org/job-seekers/training/laid-off-coal-miners.html>). Last accessed, July 24, 2016.

⁷² For example, see efforts to expand broad band internet access in Colorado’s Delta County. <http://www.region10.net/regional-development/broadband/>. Last accessed, July 24, 2016. See also National Association of Counties’ Coal-Reliant Communities Innovation Challenge. <http://www.naco.org/resources/programs-and-initiatives/coal-reliant-communities-innovation-challenge> and <http://diversifyeconomies.org/>. Last accessed July 24, 2016.

school improvement⁷³, small business support, repurposing mine lands, and infrastructure programs.⁷⁴

Recommendations: BLM should conduct thorough and robust analyses of the current and future economic conditions facing the coal industry in the Western Region, including county-specific analyses for counties with active leases. BLM should also develop a comprehensive review of tools communities can use *now* to help diversify their economies and help workers. Lastly, BLM should identify, propose, and conduct appropriate NEPA analysis of mechanisms through which the Department of the Interior can help communities become stronger and more resilient in the face of rapidly changing economic conditions.

IX. BLM LEGAL AUTHORITIES AND RULEMAKING POWERS

Implicit in much of what has been discussed in these comments is the BLM's strong legal authority to make needed changes to the federal coal program. We provide an overview of that authority below. Specifics of many of the needed changes have been discussed above.

A. BLM Has Broad Authority Under the Mineral Leasing Act and the Federal Land Policy and Management Act.

The BLM has broad authority to modify the federal coal program as needed pursuant to its authority under the MLA and FLPMA. Under the MLA, the Secretary of the Interior has wide discretionary authority to issue coal leases on the federal mineral estate. 30 U.S.C. § 201(a)(1). Prior to issuing coal leases the Secretary is to consider the effects of mining, including, but not limited to, environmental impacts, impacts on agriculture and economic activities, and impacts on public services. *Id.* § 201(a)(3)(C). Leases are to have limited lengths (20 years) and require production of commercial quantities of coal as well as have annual rentals and royalties on coal production, and “such other terms and conditions as the Secretary shall determine.” *Id.* § 207(a). “Prior to taking any action on a leasehold which might cause a significant disturbance of the environment . . . the lessee shall submit for the Secretary’s approval an operation and reclamation plan.” *Id.* § 207(c).

FLPMA sets out a policy that the Secretary is required to “establish comprehensive rules and regulations” for the administration of the public land statutes such as the MLA. 43 U.S.C. § 1701(a)(5). The public lands are to be “managed in a manner that will protect the quality of the scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that where appropriate will preserve and protect certain public lands in their natural condition; that will provide for food and habitat for fish and wildlife . . .” *Id.* § 1701(a)(8). In managing the public lands the Secretary of the Interior “shall, by regulation or otherwise, take any action necessary to prevent unnecessary or undue degradation of the lands.” *Id.* § 1732(b). As already mentioned, it is the policy of the United States under FLPMA that “the

⁷³ See <http://ieefa.org/invest-struggling-coal-industry-communities-let-us-count-ways/>. Last accessed July 24, 2016.

⁷⁴ See also Adele C. Morris, “Build a Better Future for Coal Workers and their Communities,” The Brookings Institution, Washington, D.C., APRIL 25, 2016. <http://www.brookings.edu/~media/research/files/reports/2016/04/25-coal-workers-morris/build-a-better-future-for-coal-workers-and-their-communities-morris-updated-071216.pdf>. Last accessed, July 24, 2016.

United States receive fair market value of the use of the public lands and their resources” *Id.* § 1701(a)9). And, as well, there is a recognition of the need to manage the public lands “in a manner which recognizes the Nation’s need for domestic sources of minerals” *Id.* § 1701(a)(12).

The most fundamental requirement of FLPMA is to manage the public lands for multiple-use and sustained yield. The definition of multiple-use is broad but among other things it requires: (1) management so that the lands “are utilized in the combination that will best meet the present and future needs of the American people;” (2) “the use of some land for less than all of the resources;” and (3) “harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output.” 43 U.S.C. § 1702(c). Sustained yield is management that achieves a high level annual or regular periodic output of renewable resources in perpetuity. *Id.* § 1702(h). The Secretary of the Interior “shall manage the public lands under principles of multiple use and sustained yield” *Id.* § 1732(a).

In addition to managing the public lands to achieve multiple-use and sustained yield, FLPMA includes wide-ranging provisions requiring the development of RMPs to achieve this. 43 U.S.C. §§ 1712, 1732(a). FLPMA also provides that the Secretary “shall issue regulations necessary to implement the provisions of this Act with respect to the management, use, and protection of the public lands” *Id.* § 1733(a). And moreover, the Secretary “with respect to the public lands shall promulgate rules and regulations to carry out the purposes of this Act and of other laws applicable to the public lands” *Id.* § 1740.

Moreover, under both FLPMA and the MLA, the BLM has discretion to issue leases or permit other activities on the federal lands. The MLA explicitly provides that coal leasing will be decided upon by the Secretary of the Interior “in his discretion.” 30 U.S.C. § 201(a)(1). Similarly, FLPMA provides for the agency to decide how public lands are managed “making the most judicious use of the land for some or all of these resources or related services.” 43 U.S.C. § 1702(c). This discretion has been upheld in the face of numerous challenges and is highlighted by the agency in the context of managing mineral leasing. *See, e.g., Wyoming ex rel. Sullivan v. Lujan*, 969 F.2d at 877, 882 (10th Cir. 1992) (“By law that discretion is vested absolutely in the federal government’s executive branch”); *see also Marathon Oil Co. v. Babbitt*, 966 F. Supp. 1024 (D. Colo. 1997); *affirmed* 166 F.3d 1221 (10th Cir. 1999); *cert. denied* 528 U.S. 819 (1999).

The BLM has also highlighted its discretion to authorize uses of the public land in discussing its authority to condition such uses on other actions, including mitigation. BLM’s current mitigation policy provides: “The BLM may expressly condition its approval of the land-use authorization on an applicant’s commitment to perform or cover the costs of mitigation, both onsite and outside the area of impact.” Draft MS-1794 – Regional Mitigation Manual Section, p. 1-6.

Clearly the BLM has wide ranging authority under the MLA and FLPMA to manage the coal program and incorporate needed policy changes through administrative measures, including issuing interim guidance during the pendency of the PEIS process. This authority further

supports BLM's ability to engage in needed rulemaking to implement changes that are found to be needed in the federal coal program as a result of the analysis in the PEIS.

B. BLM Has Additional Authorities as a Landowner.

Another factor that gives the BLM broad authority to protect public lands that are affected by the federal coal program is its status as a landowner—the proprietary owner of the public lands.⁷⁵ It is widely recognized that federal land management agencies derive power to manage the public lands from two sources: Their powers as a sovereign representative of the people, and the powers that all landowners have to control the management of their property.

The BLM acts “in a proprietary capacity” under the MLA. *United States v. Ohio Oil*, 163 F.2d 633, 639-40 (10th Cir. 1947). The Congress has “reserved to the Government the right to supervise, control, and regulate” the development of federal leasable minerals. *Boesche v. Udall*, 373 U.S. 472, 481 (1963). And under the MLA, leased land is subject to “exacting restrictions and continuing supervision by the Secretary.” *Id.* at 477-78. Thus, the BLM is clearly both the manager and the steward of the public lands. And while leasing conveys a right to develop hydrocarbon resources, title to the land remains with the U.S.—the BLM remains the landowner.

Thus, the BLM should recognize its powers as a landowner as it develops plans pursuant to the PEIS, and implements them through any needed rulemaking or through other administrative actions. These proprietary powers as a landowner supplement the powers under the MLA and the FLPMA that have been discussed. These powers are reemphasized in the MLA where it is stated, “[e]ach lease shall contain provisions for the purpose of insuring the exercise of reasonable diligence, skill, and care in operation of said property” and the lease is to be “for the protection of the interests of the United States” and is to be “for the safeguarding of the public welfare.” 30 U.S.C. § 187.

C. Planning 2.0 Will Set Out Additional Direction for Applying BLM's Land Use Planning and Management Authorities.

In addition, the BLM is currently developing new regulations that will govern land use planning. These rules will govern the development, revision, and amendment of RMPs. This process is referred to as “Planning 2.0.” When these new regulations are put in place—likely long before the PEIS is completed—they will provide another source of authority the BLM should consider in developing coal program regulations as well as any needed RMP amendments and revisions. The new planning rules could also affect any needed interim guidance.

The final planning rules will likely require landscape scale planning, not simply planning based at the field office level. Consistent with this direction, the BLM's coal leasing program should be conducted from a national perspective, not a local or even state level perspective, and regional mitigation strategies will be developed at a landscape level, as well. Further, the regulations will likely emphasize the importance of identifying places and values that should be protected and where different types of energy development might be appropriate. The new Planning 2.0

⁷⁵ We recognize of course that the United States is the owner of these lands, but we will refer to the ownership being held by the BLM, the federal agency charged with managing these lands.

regulations will also likely establish procedures for efficiently updating RMPs, including amendments, that will support the actions we recommended to apply suitability and multiple use considerations to leasing availability at the RMP level, as well as to incorporate mitigation plans. The BLM will need to consider the updated planning regulations and follow-on revisions to the agency's Land Use Planning Handbook in terms of overall management approaches and applying protective land designations in the federal coal program.

Recommendations: Given its broad legal power, the BLM clearly has sufficient authority to implement the protective measures and reforms we are recommending for the federal coal program, including those related to updating key elements of the federal coal program, mitigating impacts, and evaluating and addressing climate change impacts. These reforms will ensure that the coal program is conducted in the public interest and achieves a fair market return to the American people.

X. ADDITIONAL DECISIONS TO BE TAKEN.

Based on the recommendations in these comments, the BLM will need to make specific decisions and take specific actions, which will be supported by the analysis in the PEIS and are within the scope of BLM's authority, but may require action outside the PEIS.

A. RMP Amendments.

In order to implement updates to leasing availability decisions and incorporate phased or prioritized leasing, the BLM will have to amend existing RMPs in coal country. As proposed above, the recently approved Buffalo Field Office RMP in the coal-rich Powder River Basin in Wyoming should be a priority for updating through a targeted amendment. The PEIS can amend priority RMPs and also make provision for initiating additional amendments.

In initiating these RMP amendments it will be necessary to consider specific coal mines and the communities adjacent to them. It will also probably be necessary to consider power plants that utilize federal coal to generate electricity. While much of the coal mined in the Powder River Basin is shipped far away, many federal coal mines are near to local power plants. Power plants in the Powder River Basin, the Jim Bridger Power Plant near Rock Springs, Wyoming, and the Craig and Hayden power plants in Colorado are in this category. The PEIS should consider these issues as part of amending these priority plans.

In considering local RMPs and the need for amending them, the BLM should also consider the issue of local community "transition" from the coal industry. This issue has of course been important as the BLM has developed this review and reform of the federal coal program, as discussed in more detail in Section VIII above.

A number of communities, such as Gillette in Wyoming and Paonia and Somerset in Colorado have already been significantly affected by the decline in the coal industry, and there is every likelihood these trends will continue. This may well be true whatever the BLM decides relative to the federal coal program due to the severe economic problems many coal companies are facing. But regardless, the BLM should be sensitive to this issue and seek to assist in rectifying

these problems. In many cases the BLM may not be able to directly address economic and social issues that are impacting a local community—such as reduced employment or the loss of school teachers, for example—but it can, at a minimum, address this issue in the PEIS and seek to enlist the aid of other local, state, and federal agencies that do have the capability, and legal obligation, to address these issues, as discussed in more detail in Section VIII above.

The fundamental decision that will need to be evaluated in all existing RMPs that authorize coal leasing is whether areas are “acceptable for further consideration for leasing.” And if an area subject to updated analysis is found to not be acceptable for leasing, it should be removed from the leasing pool. In particular, areas with high levels of environmental conflict need to be removed from the leasing pool. Accordingly, we recommend BLM set a schedule for completing amendments to update leasing availability for RMPs outside the priority plans for amendment.

B. Interim Guidance Should Be Issued.

In addition to amending RMPs, there is also a need for interim guidance from the BLM to guide coal development during the pendency of the PEIS process.

Under S.O. 3338 provision is made for “exceptions” or “exclusions” from the coal leasing pause. Emergency leasing, lease modifications, lease exchanges, preference right leases, and LBAs where NEPA compliance is complete, including those vacated by judicial decision but undergoing revaluation, are not subject to the pause. These possible continuations of the federal coal development program need to be carefully considered if the PEIS is to be as effective as possible. Therefore, interim guidance—including through Instruction Memoranda—should be issued to carefully define when any of these exclusions might be appropriate. The attempt that has been made to allow for an “emergency lease” at the Alton coal field in Utah is an example of the potential for these exceptions to be controversial.

Interim guidance should also be issued to:

1. Define the “public interest” that governs decisions in the coal program and elaborate on how this can and should be taken into account in evaluating leasing proposals.
2. Require tracking and quarterly reporting of climate emissions;
3. Require development and application of a climate budget, as well as quarterly reporting on actions taken toward achieving the budget;
4. Reiterate the intent and application of the unsuitability criteria and multiple-use considerations and require evaluation of whether proposed leases meet these criteria in the context of the planning area prior to any new leasing;
5. Require that BLM complete and document all 4 steps of the screening process as part of the land use planning process, with an emphasis on ensuring that BLM evaluates the “multiple use considerations” carefully, looking at impacts on land health, species, water, air and protected lands, to determine if conflicts would support making land unavailable and/or specifying required mitigation practices. The policy would also note that the types of “land uses” to be protected by application of the multiple use consideration include the preemption of renewable energy development and other uses that would have the effect of reducing the climate change contribution of the federal lands.

6. Require an enhanced showing of technical and financial capability to qualify for leasing.

C. Rulemakings Should Be Prioritized and Conducted to Implement Reforms.

In addition, the BLM may need to conduct formal rulemakings to incorporate specific reforms. The BLM can conduct needed NEPA analysis to support the rulemakings and make the ultimate processes more efficient. The BLM should commit to completing these rulemakings, set out a schedule, and prioritize the following rulemakings where the agency determines they are needed to fulfill reforms:

1. Update and expand unsuitability criteria;
2. Update royalty, minimum bid, rental rates and reclamation bonding standards;
3. Incorporate a carbon adder into royalty rates;
4. Develop an updated regional coal leasing approach;
5. Shorten lease review terms;
6. Complete Mine Methane Waste Rule.

Recommendations: The BLM has a great deal of legal authority that would allow it to make any changes that are needed to RMPs and to issue any needed interim guidance. It also has full authority to make the various decisions that we have asked for, such as putting in place provisions to reduce the impacts of climate change. The PEIS should recognize the depth of this authority and make decisions from that standpoint.

XI. PURPOSE AND NEED

A fundamental matter that the BLM will have to address during scoping is to define the Purpose and Need for the PEIS. An EIS must contain a statement of the Purpose and Need to which the agency is responding. 40 C.F.R. § 1502.13. As discussed in the first section of these comments, defining the Purpose and Need for an EIS, and thus the alternatives considered in it, is an important aspect of the scoping phase of the NEPA process.

The BLM NEPA Handbook also discusses developing a Purpose and Need statement for an EIS. The BLM feels that the need for a project is often the “underlying problem” that is being addressed. BLM Handbook H-1790-1 at 35. And the purpose of a project is the goal or objective that the BLM is seeking. *Id.* As the BLM recognizes, and as court opinions have emphasized, the Purpose and Need statement cannot be arbitrarily narrow, although the BLM has considerable flexibility in defining the Purpose and Need. *Id.*

The CEQ has determined that “[a]gencies draft a “Purpose and Need” statement to describe what they are trying to achieve by proposing an action.” CEQ *A Citizen’s Guide to NEPA, Having Your Voice Heard* at 16. “The identification and evaluation of alternative ways of meeting the purpose and need of the proposed action is the heart of the NEPA analysis.” *Id.* Thus, it is clear that the BLM should carefully develop the Purpose and Need statement in the PEIS so as to properly identify alternatives for consideration in the PEIS, and ultimately selection of the preferred alternative

Here, it seems clear that a fundamental purpose of the PEIS is to ensure the federal coal program is in alignment with the requirements, goals, and mission of the MLA and FLPMA, and to make changes as needed to meet those objectives. In our view, specific needs could include:

- Ensuring the coal program meets and is conducted in the public interest and provides a net benefit to society.
- Ensuring the public welfare is protected and the public trust responsibility is maintained.
- Ensuring the coal program provides fair market value to taxpayers.
- Ensuring the BLM’s multiple-use mission and goals are met, including addressing issues related to climate change so that the nation’s climate change objectives can be met.
- Providing for a landscape scale analysis that fully considers and manages the pace, scale, location and timing of leasing so that the BLM can best determine how, where and when to lease.
- Ensuring the PEIS is consistent with all existing laws and policies, including current guidance, for mitigation, including mitigation of climate impacts.

We believe that this range for the Purpose and Need statement would be sufficiently targeted to guide development of an appropriate range of alternatives to consider in the PEIS, which we considered above in section VIII, the alternatives section. This range for the Purpose and Need statement would also help ensure that the BLM’s preferred alternative and the proposed action were well based and grounded in the analysis in the PEIS.

Recommendations: The BLM must include a thorough Purpose and Need in the Coal PEIS to guide appropriate development and analysis of alternatives.

XII. CONCLUSION

We would like to thank you for considering these comments. The Wilderness Society looks forward to remaining involved in the BLM’s review of the federal coal program as this NEPA process moves forward, including in a review of the scoping report.

Sincerely,

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Attachment 1. History of the Origins of the Carbon Budget Concept in the Scientific Literature

In 2012, the International Energy Agency, an international organization established to “provide authoritative research and analysis on ways to ensure reliable, affordable and clean energy” for its members,⁷⁶ concluded there is a limit to the amount of fossil fuels that can be developed if the world is to remain within acceptable warming thresholds. Based on an assessment of global carbon reserves, and given existing pollution controls, the agency concluded that “[n]o more than one-third of proven reserves of fossil fuels can be consumed prior to 2050 if the world is to achieve the 2-degree C goal.”⁷⁷

In the fall of 2014, this analysis was expanded and strengthened by the Intergovernmental Panel on Climate Change (Panel). The Panel published a comprehensive synthesis of the latest worldwide scientific consensus on climate change, called the Climate Change 2014 Synthesis Report.⁷⁸ The synthesis describes the recent scientific consensus that there is an overall limit to the amount of carbon dioxide (CO₂) that can be released into the atmosphere to stay within the 2 degree C warming cap.⁷⁹ It calculated that emissions from the year 1870 on would need to be limited to about 2,900 gigatons of CO₂ (GtCO₂) to have a reasonable chance of staying within the cap.⁸⁰ The Panel noted that as of 2011, about 1,900 GtCO₂ had already been emitted.⁸¹ Therefore, the report concluded, to provide better than a 66 percent chance of limiting warming to less than 2 degree C, additional carbon dioxide emissions must be limited to 1,000 GtCO₂.⁸² The Panel also estimated that there are about 3,670 to 7,100 GtCO₂ in proven fossil fuel “reserves” remaining in place,⁸³ which it describes as quantities of fossil fuels “able to be recovered under existing economic and operating conditions.”⁸⁴ As the report notes, this volume of reserves is four to seven times the amount that can be burned to have better than a 66 percent

⁷⁶ International Energy Agency, World Energy Outlook 2012 at 2 (2012), *available at* https://www.iea.org/publications/freepublications/publication/WEO2012_free.pdf.

⁷⁷ *Id.* at 25.

⁷⁸ Intergovernmental Panel on Climate Change (Panel), Climate Change 2014: Synthesis Report (2014), *available at* <http://www.ipcc.ch/report/ar5/syr/>. In fact, a carbon budget has been assessed by the IPCC in all assessment reports (Ciais et al., 2013; Denman et al., 2007; Prentice et al., 2001; Schimel et al., 1995; Watson et al., 1990), as well as by others (e.g. Ballantyne et al., 2012). These assessments included budget estimates for the decades of the 1980s, 1990s (Denman et al., 2007) and, most recently, the period 2002–2011 (Ciais et al., 2013). The IPCC methodology has been adapted and used by the Global Carbon Project (GCP, www.globalcarbonproject.org), which has coordinated a cooperative community effort for the annual publication of global carbon budgets up to the year 2005 (Raupach et al., 2007), 2006 (Canadell et al., 2007), 2007 (published online; GCP, 2007), 2008 (Le Quéré et al., 2009), 2009 (Friedlingstein et al., 2010), 2010 (Peters et al., 2012b), 2012 (Le Quéré et al., 2013; Peters et al., 2013), 2013 (Le Quéré et al., 2014), and most recently 2014 (Friedlingstein et al., 2014; Le Quéré et al., 2015). Each of these papers updated previous estimates with the latest available information for the entire time series. From 2008, these publications projected fossil fuel emissions for one additional year using the projected world gross domestic product (GDP) and estimated trends in the carbon intensity of the global economy (Rogelj, 2016).

⁷⁹ *Id.* at 63.

⁸⁰ *Id.*

⁸¹ *Id.*

⁸² *Id.*

⁸³ *Id.* at 64 Table 2.2.

⁸⁴ *Id.* at Table 2.2 n.f (defining “reserves” and noting that “resources,” by contrast, are quantities of fossil fuels where economic extraction is potentially feasible).

chance of remaining within the 2 degree C warming goal.⁸⁵ One of the expert reports feeding into the Panel’s synthesis explained that to meet “[t]he emissions budget for stabilizing climate change at 2 degree C above pre-industrial levels... only a small fraction of reserves can be exploited.”⁸⁶

The Panel’s synthesis analysis was refined further in January 2015, when the scientific journal *Nature* published a study entitled “The geographical distribution of fossil fuels unused when limiting global warming to 2 degree C.”⁸⁷ The study identifies which fossil fuels must remain undeveloped to improve the chances of remaining below the warming cap. It quantifies the regional distribution of fossil-fuel reserves and resources and, through modeling a range of scenarios based on least-cost climate policies, identifies which reserves and resources could not be burned between 2010 and 2050 if the world efficiently complies with the 2 degree C limit.⁸⁸ It concludes that “a stark transformation in our understanding of fossil-fuel availability is necessary,” because “large portions of the reserve base and an even greater proportion of the resource base should not be produced if the temperature rise is to remain below 2 degree C.”⁸⁹ Thus, expanding on the prior analyses’ conclusion that development of already-existing reserves would far exceed the cap, let alone development of the more speculative category of resources, the study concludes that a commitment to meet the 2 degree C limit would “render unnecessary continued substantial expenditure on fossil-fuel exploration, because any new discoveries could not lead to increased aggregate production.”⁹⁰

⁸⁵ *Id.* at 63.

⁸⁶ Blanco, Gabriel *et al.*, Drivers, Trends and Mitigation, in Climate Change 2014: Mitigation of Climate Change, Working Group III Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change at 251, 380 (2014), available at http://www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_chapter5.pdf.

⁸⁷ McGlade, Christophe and Paul Ekins, *The Geographical Distribution of Fossil Fuels Unused When Limiting Global Warming to 2 °C*, 517 *Nature* (187) (2015).

⁸⁸ *See id.* at 187-90.

⁸⁹ *Id.* at 190.

⁹⁰ *Id.* at 187.

Attachment 2. Selected Major Authorities, Regulations, and Guidance Addressing Mitigation

The Interior Department compiled a list of authorities, regulations, and guidance supporting their efforts to advance mitigation policies in *A Strategy for Improving the Mitigation Policies and Practices of The Department of the Interior: A Report to The Secretary of the Interior from the Energy and Climate Change Task Force*⁹¹ that includes, but is not limited to:

National Environmental Policy Act (NEPA) - 42 U.S.C. §4371 et seq.

NEPA aims to integrate environmental values into decision making by requiring agencies to analyze the environmental impacts of proposed actions that may significantly impact the environment. 42 U.S.C. § 4332(2)(C). Council on Environmental Quality and Department of the Interior regulations implementing NEPA recognize the potential for mitigation to ameliorate impacts of a proposal and require agencies to include in their analyses appropriate mitigation measures not already included in the proposed action or alternatives. 40 C.F.R. §§ 1502.14(f), 1502.16(h); 43 C.F.R. § 46.130. Mitigation is defined broadly, to include means by which impacts can be avoided, minimized, rectified, and reduced, as well as means for compensating for impacts through replacement of resources. 40 C.F.R. § 1508.20. The regulations further require that agency decisions must “[s]tate whether all practicable means to avoid or minimize environmental harm from the alternative selected have been adopted, and if not, why they were not.” 40 C.F.R. § 1505.2(c). CEQ guidance recognizes the importance of mitigation, including the use of mitigation to ensure that impacts of a proposed action will not be significant, along with monitoring and other mechanisms for ensuring that mitigation is implemented, thus enabling agencies to reach a Finding of No Significant Impact (i.e., a “mitigated FONSI”). Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact (January 14, 2011).

Federal Land Policy and Management Act (FLPMA) – 43 U.S.C. § 1701 et seq.

FLPMA requires that the public lands be managed “on the basis of multiple use and sustained yield,” 43 U.S.C. § 1701(a)(7), and “in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resources, and archeological values....” 43 U.S.C. § 1701(a)(8). Under the broad discretion afforded by FLPMA, the BLM can condition uses of the public lands authorized through various instruments (e.g., rights-of-way, permits, licenses, easements, etc.) on the implementation of mitigation measures intended to reduce impacts. The BLM’s recently issued draft mitigation policy provides policy, procedures, and instructions for developing strategies that identify and facilitate regional mitigation strategies, using BLM’s land use planning process to identify potential mitigation sites and measures, and identifying and implementing appropriate mitigation within or outside of the area of impact for particular land-use authorizations. Interim Draft Policy on Regional Mitigation; Manual Section 1794 (June 13, 2013).

⁹¹ Clement, J.P. et al. 2014. A strategy for improving the mitigation policies and practices of the Department of the Interior. A report to the Secretary of the Interior from the Energy and Climate Change Task Force, Washington, D.C.

Mineral Leasing Act (MLA) - 30 U.S.C. § 181 et seq.

The MLA governs leasing of several minerals, most notably oil and gas. The BLM is required, at a minimum, to hold quarterly auctions of oil and gas leases in each state, 30 U.S.C. 226(b)(1). Leases are issued for 10 year terms and may be extended for as long as they produce oil or gas in paying quantities, and include stipulations for reducing impacts of development, Id., 226(e); 43 C.F.R. 3101.1-3. Prior to drilling, operators must file an application for a permit to drill (APD) that, when issued, can require additional measures for mitigating anticipated impacts of development, 30 U.S.C. 226(f), (g).

National Landscape Conservation System (NLCS, Organic Act) - 16 U.S.C. § 7201 et seq.

The NLCS was established “in order to conserve, protect, and restore nationally significant landscapes that have outstanding cultural, ecological, and scientific values for the benefit of current and future generations” and that “The Secretary shall manage the system...in a manner that protects the values for which the components of the system were designated.” Under this direction, the BLM has implemented policy to require mitigation of impacts in order to protect the objects and values for which the units of the NLCS were designated. For example, BLM Manual Section 6100 § 1.6.A.3 describes how “valid existing rights and other non-discretionary uses occurring within NLCS units will be managed to mitigate associated impacts to the values for which these lands were designated”. Similarly, BLM Manual Section 6220 § 1.6.E.5.b describes how “the effects of projects from the grants of the (rights-of-way) must be mitigated” for National Monuments and National Conservation Areas. Additionally, BLM Manual Section 6100 § 1.6.C.5 identifies how NLCS units provide good locations for compensatory mitigation projects.

Endangered Species Act of 1973 (ESA) - 16 U.S.C. § 1531 et seq.

Under Sections 7 and 10 of the ESA, the FWS may recommend means to avoid and minimize the take of listed wildlife species, as well as to establish targeted habitat. Under Section 7, Federal agencies must consult with FWS or National Marine Fisheries Service to ensure that agency actions are not likely to jeopardize the continued existence of a listed species or destroy or adversely modify designated critical habitat. The biological opinion issued by FWS or NMFS includes an incidental take statement, if appropriate, and provides reasonable and prudent measures that must be implemented to minimize the impacts of any anticipated take of listed wildlife species. Where a jeopardy or adverse modification opinion is rendered, reasonable and prudent alternatives will be recommended. Landowners who wish to develop private lands inhabited by listed wildlife species may receive an incidental take permit from FWS under Section 10, provided they have developed an approved habitat conservation plan (HCP), which sets out steps that the permit holder will take to avoid, minimize, and mitigate the impacts on species likely to occur from the proposed action. Off-site mitigation banks often play a key role in meeting conservation requirements under an HCP. Candidate Conservation Agreements, also under Section 10, are voluntary agreements where landowners agree to carry out measures to assist in the conservation of candidate and other at-risk species.

The FWS issued a mitigation policy in 1981 to help the agency make consistent and effective mitigation recommendations to protect and conserve the most important and valuable fish and wildlife resources, while facilitating balanced development of the Nation’s natural resources; U.S. Fish and Wildlife Service Mitigation Policy (46 FR 7644-7663, 1981). FWS has also issued

guidance to help the agency evaluate proposals for establishing conservation banks for the purpose of off-setting adverse impacts to listed species. Guidance for the Establishment, Use, and Operation of Conservation Banks (May 2, 2003). More recently, FWS issued draft guidance that describes a crediting framework for Federal agencies in carrying out recovery of threatened and endangered species. Under the draft guidance, Federal agencies could show how adverse effects of agency activities to a listed species are offset by beneficial actions taken elsewhere for that species, so long as there is a net conservation benefit to the species. Draft Guidance on Recovery Crediting for the Conservation of Threatened and Endangered Species; 72 Federal Register 62258 (November 2, 2007).

Fish and Wildlife Coordination Act (FWCA) – 16 USC § 661-667e.

The FWCA establishes fish and wildlife conservation as a coequal objective of all federally-funded, permitted, or licensed water-related development projects. Under the FWCA, Federal agencies developing such projects must consult with FWS (and NMFS in some instances) and the states regarding fish and wildlife impacts. The statute provides FWS with authority to investigate and prepare reports providing mitigation analyses on all water-related development projects; FWS mitigation recommendations may include measures addressing a broad set of habitats beyond the aquatic impacts triggering the FWCA and species beyond those covered by other resource laws.

National Historic Preservation Act (NHPA) - 16 U.S.C. § 470 et seq.

The NHPA is a procedural statute that requires Federal agencies under Section 106 to take into account the effects of their undertakings on historic properties, and to afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on these undertakings. For the purposes of NHPA, historic properties include properties that are listed in or eligible for listing in the National Register of Historic Places. Through the implementing regulations of Section 106, which are contained in 36 CFR Part 800, "Protection of Historic Properties," federal agencies are required to consult with State/Tribal Historic Preservation Officers, Indian tribes or Native Hawaiian Organizations, local governments, interested parties such as historic preservation advocacy organizations, the public, and the ACHP. Consultation includes assessing whether or not the undertaking will have adverse effects on such properties and measures to resolve those adverse effects. Section 110(f) specifically addresses mitigation of adverse effects to properties of national significance, requiring that "prior to the approval of any Federal undertaking which may directly and indirectly affect any National Historic Landmark, the head of the responsible Federal agency shall, to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to such landmark." In many instances, the Section 106 consultation process will result in the execution of a memorandum of agreement, see 36 C.F.R. § 800.6(c), which may include federal agency commitments to avoid or mitigate any adverse effects.

Clean Water Act - 33 U.S.C. § 1251 et seq.

Section 404 of the Clean Water Act provides extensive authority to the U.S. Army Corps of Engineers and the Environmental Protection Agency to conduct mitigation where federal actions impact waters of the United States. The FWS has specific authority under Section 404(m) to secure mitigation for impacts to aquatic resources nationwide. Section 404 (m) requires the Secretary of the Army to notify the Secretary of the Interior, through the FWS Director, when a

permit application has been received or when the Secretary proposes to issue a general permit, and FWS can submit written comments within 90 days. Through its comments, FWS can assist the Corps of Engineers in developing permit terms that avoid, minimize or compensate for permitted impacts. Through its policy on compensatory mitigation related to the National Wildlife Refuge System, FWS has established guidelines for using Refuge lands for siting compensatory mitigation for impacts permitted through Section 404 or Section 10 of the Rivers and Harbors Act. Final Policy on the National Wildlife Refuge System and Compensatory Mitigation under the Section 10/404 Program (64 FR 49229-49234, 1999).

Clean Air Act - §7401, et seq.

The Clean Air Act calls for the prevention and control of air pollution across the country and includes a national goal to “to preserve, protect and enhance the air quality in national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreational, scenic or historic value” (42 U.S.C. §7470(2)). It sets forth an affirmative duty to protect air quality and air quality related values (e.g., visibility and ecosystem resources) of national parks and wilderness areas designated as Class I areas under the statute by avoiding and minimizing impacts to such areas. The Clean Air Act also provides for the banking and trading of emissions reductions and use of emission offsets to capture cost efficiencies. The NPS, BLM, FWS, US Forest Service and the EPA have entered into a memorandum of understanding that adopts a standardized approach that facilitates the completion of NEPA environmental analyses for federal land use planning and oil and gas development decisions and leads to improved design and implementation of mitigation measures that will both protect air quality and air quality related values and provide opportunities for future oil and gas development.

NPS Organic Act of 1916 and General Authorities Act of 1970, as amended - 16 U.S.C. §1, et seq. Under the Organic Act, the National Park Service (NPS) in the Department of the Interior is charged with managing the units of the National Park System so as to “conserve the scenery and the national and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations. Through the General Authorities Act as amended, Congress directed that “the authorization of activities shall be construed and the protection, management and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as many have been or shall be directly and specifically provided by Congress.” These authorities, among others, provide a framework for the Secretary of the Interior to be proactive in protecting the resources and values of the National Park System and for bureaus within the Department to mitigate the impacts of their discretionary activities on the resources and values of park units.

Paleontological Resources Preservation Act (PRPA) - 16 U.S.C. § 470aaa et seq.

This statute states that federal agencies “shall manage and protect paleontological resources on Federal land using scientific principles and expertise.” In areas determined to have high or undetermined potential for significant paleontological resources, the agency must implement an adequate program for mitigating the impact of development, including surveys, monitoring, salvage, identification and reporting, and other activities required by law.

White House Guidance and Initiatives Executive Order (EO) 13604 on Improving Performance of Federal Permitting and Review of Infrastructure Projects (March 28, 2012).

The EO calls for more timely and efficient Federal permitting and review of infrastructure projects while improving environmental and community outcomes. To achieve that objective, the order calls on agencies to integrate reforms into project planning processes “so that projects are designed appropriately to avoid, to the extent practicable, adverse impacts on public health, security, historic properties and other cultural resources, and the environment, and to minimize or mitigation impacts that may occur.”

A Federal Plan for Modernizing the Federal Permitting and Review Process for Better Projects, Improved Environmental and Community Outcomes, and Quicker Decisions (June 2012).

The Plan calls on Federal agencies to identify opportunities to improve mitigation processes by integrating intra- and inter-agency processes and encouraging mitigation planning at the regional, watershed and landscape levels, and to move away from addressing mitigation at the end of project development and on a project-by-project basis.

Presidential Memorandum on Modernizing Federal Infrastructure Review and Permitting Regulations, Policies, and Procedures (May 17, 2013).

The Memorandum recognizes landscape- and watershed-level mitigation practices as means by which agencies have achieved better outcomes for communities and the environment and realized substantial time savings in review and permitting. The Memorandum directs an interagency leadership team to, among other things, expand the use of IT tools to facilitate monitoring of mitigation commitments and “identify improvements to mitigation policies to provide project developers with added predictability, facilitate landscape-scale mitigation based on conservation plans and regional environmental assessments, facilitate interagency mitigation plans where appropriate, ensure accountability and the long-term effectiveness of mitigation activities, and utilize innovative mechanisms where appropriate.”

Implementation Plan for the Presidential Memorandum on Modernizing Infrastructure Permitting (March 2014).

The Plan includes actions to identify policy changes to promote in-advance, landscape-scale mitigation; to facilitate high-quality and efficient permitting and review processes; to identify best practices for early engagement with tribal, state, and local governments; and to expand innovative mitigation approaches that facilitate landscape-level mitigation planning, consistent and transparent standards for applying the mitigation hierarchy, and use of in-lieu fee program and mitigation banks. The overall goal of the plan is to “modernize the Federal permitting and review process for major infrastructure projects to reduce uncertainty for project applicants, reduce the aggregate time it takes to conduct reviews and make permitting decisions by half, and produce measurably better environmental and community outcomes.”

Appendix 1. Key Executive Policies Aimed at Reducing Carbon Emissions from Federal Activities

In the past ten years under two presidents, the White House has issued a number of broad policy announcements aimed at reducing carbon emissions from activities of federal agencies in the form of Executive Orders and associated implementing instructions and guidance. These statements have laid out important targets and timetables for assessing and reducing the government's carbon footprint but have repeatedly failed to include the carbon consequences of development of federally-managed energy resources in the statements and implementing guidance.

This memo summarizes the key policy statements currently in effect, and attempts to assess whether a gap exists in the existing management approach to reducing the carbon emissions from federal activities. Attached is an in-depth look at elements of the Orders.

Summary of Policies

Key policies issued by the White House aimed at reducing the role that the federal agencies themselves play in contributing to climate emissions or reporting on the emissions of federal activities:

Executive Order 13423, Strengthening Federal Environmental, Energy, and Transportation Management, was signed by President Bush on January 24, 2007. This EO instructs Federal agencies to conduct their environmental, transportation, and energy-related activities under the law in support of their respective missions in an environmentally, economically and fiscally sound, integrated, continuously improving, efficient, and sustainable manner. The Order sets goals in several key areas including energy efficiency, power and material acquisition, renewable energy and sustainable buildings.

Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance, was signed by President Obama on October 5, 2009. This EO expanded on the energy reduction and environmental performance requirements for Federal agencies identified in EO 13423. The goal of EO 13514 was "to establish an integrated strategy towards sustainability in the Federal Government and to make reduction of greenhouse gas emissions (GHG) a priority for Federal agencies."

In addition to agency requirements for producing guidance, recommendations, and plans, EO 13514 laid out numerical and non-numerical targets, including 2020 GHG emissions reduction targets Federal Government-wide of 28 percent for *direct* and 13 percent for *indirect* emissions, increasing renewable energy procurement and generation on agency

property and pursuing opportunities with vendors and contractors to reduce GHG emission. EO 13514 also called for specific management strategies to improve sustainability including agency-specific policies and practices to reduce scope of three GHG emissions in agency operations.

EO 13514 was revoked and targets superseded by EO 13693, although much of the implementing guidance remains intact as implementing guidance for relevant provisions in the new EO.

Executive Order 13693, Planning for Federal Sustainability in the Next Decade, was signed by President Obama on March 19, 2015. This is currently the flagship EO related to greenhouse gas performance for the federal government. The EO lays out an aggressive policy statement:

“It is hereby ordered as follows...Federal leadership in energy, environmental water, fleet, buildings, and acquisition management will continue to drive national greenhouse gas reductions and support preparations for the impacts of climate change... Through a combination of more efficient Federal operations such as those outlined in this Executive order...we have the opportunity to reduce agency direct greenhouse gas emissions by at least 40 percent over the next decade while at the same time fostering innovation, reducing spending, and strengthening the communities in which our Federal facilities operate...priority should first be placed on reducing energy use and cost, then on finding renewable or alternative energy solutions... Employing this strategy for the next decade calls for expanded and updated Federal environmental performance goals with a clear overarching objective of reducing greenhouse gas emissions across Federal operations and the Federal supply chain”

This EO replaces several prior orders and policy statements, updating 2020 goals with 2025 goals, as well as clarifying several policy issues. The majority of implementing guidance in place at the agency level will continue to apply but may need to be updated.

The EO creates a government-wide organization and governance structure, including a steering committee, chief sustainability officers in each major agency, regional working groups, and a training. The Order sets a 40% emissions reduction target by 2025 using a 2008 baseline. The Order establishes an energy intensity goal and sets a 25% clean energy target and a 30% renewable energy

target by 2025. None of these targets applies to energy development on public lands.

The EO does require agencies to account for and report emissions from federal activities, but this requirement does not address federal lands energy development. Implementing a provision of the Order (and its predecessor), the Council on Environmental Quality (CEQ) has developed *Guidance on Federal Greenhouse Gas Accounting and Reporting* that establishes government-wide requirements for measuring and reporting greenhouse gas (GHG) emissions associated with Federal agency operations.

Executive Order 13642, Making Open and Machine Readable the New Default for Government Information, was signed by President Obama on May 9, 2013.

The Order declares as a statement of policy that, “Openness in government strengthens our democracy, promotes the delivery of efficient and effective services to the public, and contributes to economic growth.” To improve the discoverability and usability of data assets, the Order requires agencies to develop and Enterprise Data Inventory, which accounts for all data assets created or collected by the agency, and a Public Data Listing, which contains a list of all data assets that are or could be made available to the public. The Order requires agencies to develop protocols for ensuring that the public can directly engage the agency, data are made available to the public wherever possible and, if not, reasons for not releasing data are documented.

Analysis of Current Policies and Implementing Guidance

Although there are several government-wide emissions reduction policies, there are no reduction goals addressing emissions resulting from fossil energy leasing and development.

In-place policies set a GHG reduction goal for federal activities, targets for clean and renewable energy procurement, and requirements for improved building efficiency – but there is no target or even discussion of the carbon consequences of public lands energy development.

Agencies are not required to report on the carbon emissions of fossil energy development at the planning or project permit level, and there is no policy requirement to maintain an inventory of likely emissions from fossil energy resources already under lease. Federal

agencies are required to submit GHG inventories pursuant to the Order. The CEQ has developed government-wide requirements for measuring and reporting GHG emissions associated with federal agency operations. However, the guidance does not require nor recommend reporting on the likely emissions from federal lands fossil fuel development, although such emissions are referenced for possible voluntary reporting. The Interior Department has declined to report on emissions resulting from production, transport or end-use of fossil energy produced from federal lands and waters.

Additionally, CEQ been developing guidance that describes how Federal departments and agencies should consider the effects of greenhouse gas emissions and climate change in their NEPA reviews for individual projects. This *Guidance for Greenhouse Gas Emissions and Climate Change Impacts*, still in draft, explains that agencies should consider both the potential effects of a proposed action on climate change, as indicated by its estimated greenhouse gas emissions, and the implications of climate change for the environmental effects of a proposed action. The guidance also emphasizes that agency analyses should be commensurate with projected greenhouse gas emissions and climate impacts, and should employ appropriate quantitative or qualitative analytical methods to ensure useful information is available to inform the public and the decision-making process in distinguishing between alternatives and mitigations. The current version applies to all proposed Federal agency actions, including land and resource management actions, but has not been finalized and does not provide a standard methodology advanced for estimating the carbon consequences of federal lands energy production.

The existing policy framework supports measuring, disclosing and taking steps to manage the carbon consequences of public lands energy development. The existing policy framework clearly seeks to address all opportunities to improve the environmental performance of federal operations and to enhance access to open data assets describing key federal operations. The absence of policy to address public lands energy development is a gap that represents a blind spot for efforts to credibly ensure the federal government is leading by example.

Conclusion

The government cannot manage what it doesn't measure. While the government has made significant steps to improve the performance of federal activities, there is a fundamental lack of understanding of how much our own management of publicly-owned fossil energy resources contributes to global warming. Existing policies do not address the disclosure, measurement or management of the carbon consequences of global warming—the Obama administration can and should become the first administration in history to acknowledge and address it. A policy commitment to publically measure the carbon impact of fossil fuels on federal lands, including a target to reduce it, is consistent with standing Executive Orders and implementing policies. Including this missing piece will go a long ways towards ensuring that federal lands are put to use as part of a climate solution and not a climate problem.

Table 1. Executive Orders Addressing Federal Agency Greenhouse Gas Emissions

Executive Order	Implementing Instructions	Inventory/Reporting Requirements	Key GHG Reduction Goals	Agency Requirements/ Exceptions
<p>E.O. 13693 (March 19, 2015)</p> <p>Planning for Federal Sustainability in the Next Decade</p>	<ul style="list-style-type: none"> - Implementing Instructions for EO 13693 Planning for Federal Sustainability in the Next Decade of June 10, 2015; - Sustainable Locations for Federal Facilities of September 15, 2011; - Sustainable Practices for Designed Landscapes of October 31, 2011, as supplemented on October 22, 2014; - Federal Greenhouse Gas Accounting and Reporting Guidance [Revision 1] of June 4, 2012; and - Federal Agency Implementation of Water Efficiency and Management Provisions of EO 13514 of July 10, 2013 	<ul style="list-style-type: none"> - Principal agencies (those responsible for the majority of GHG emissions and those managing the federal fleet) are subject to the OMB scorecard process - OMB annually reports on Federal agencies' and departments' progress toward meeting sustainability goals. A Steering Committee meets four times a year to receive and discuss reports 	<ul style="list-style-type: none"> - 40% emissions reductions by FY2025 (FY2008 baseline) for scope 1 and 2 emissions (excluding federal lands energy development) - Continue progress in scope 3 emissions reductions of 13% by FY2020 (off FY2008 baseline) for six types of indirect emissions (excluding federal lands energy development) - 25% of their total facility energy (electric and thermal) is from clean energy sources by 2025. - 30% renewable energy target by 2025 - Reduce energy intensity in Federal buildings by 2.5% per year between 2015 and 2025 (total 25% reduction off FY2015 baseline). - Reduce per-mile GHG emissions from Federal fleets by 30% from 2014 levels by 2025, and increase the percentage of zero emission and plug in hybrid vehicles in Federal fleets. - Relative to the baseline of the agency's building energy use, reduce building 	<ul style="list-style-type: none"> - Agencies submit GHG emissions goal within 90 days of EO (replaces FY2020 targets set under EO 13514) - Established Determining Agency Reduction Targets 2 tool (DART II) to assist agencies in setting targets

Executive Order	Implementing Instructions	Inventory/Reporting Requirements	Key GHG Reduction Goals	Agency Requirements/ Exceptions
			energy intensity by 2.5% through the end of FY2025 - If agency operates fleet of >20 vehicles, they must improve agency fleet and vehicle efficiency by no less than 4% by the end of FY2017	
E.O. 13423 (January 24, 2007) Strengthening Federal Environmental Energy, and Transportation Management	<ul style="list-style-type: none"> - Instructions for Implementing EO 13423 of March 29, 2007 - DOI Departmental Manual 515 DM 4 of August 13, 2008 - USDA Departmental Regulation 1058-001 of January 16, 2009 - BLM Instruction Memorandum 2012-104 of April 24, 2012 - Presidential Memorandum regarding Federal Fleet Performance of May 24, 2011 	<ul style="list-style-type: none"> - Each agency is required to provide compliance data to DOE no later than Dec. 31 of each year, starting with the FY 2007 data and each year thereafter. - Each agency shall implement internal policies that will ensure accurate tracking of vehicle acquisitions. 	<ul style="list-style-type: none"> - Reduce GHGs by 3% annually or 300% by 2015 - Increase alternative fuel consumption at least 10% annually - Reduce petroleum consumption in fleet vehicles by 2% annually through 2015 	<ul style="list-style-type: none"> - All agencies that operate 20 or more motor vehicles with the U.S. must comply with these instructions.
Executive Order 13642 (May 9, 2013) Making Open and Machine Readable the New Default for Government Information	<ul style="list-style-type: none"> - Office of Management and Budget Memorandum M-13-13 of May 9, 2013 	<ul style="list-style-type: none"> - None 	<ul style="list-style-type: none"> - None 	<ul style="list-style-type: none"> - Agencies must develop an Enterprise Data Inventory within six months - Agencies must create a Public Data Listing

<p>Executive Order 13514 (October 5, 2009)</p> <p>Federal Leadership in Environmental, Energy, and Economic Performance</p>	<p><i>Revoked and/or superseded by EO 13693</i></p> <ul style="list-style-type: none"> - Instructions on Implementing EO 13514 Presidential Memorandum on Renewable Energy Target of December 5, 2013 - Presidential Challenge on Performance Contracting of May 24, 2014 	<p>-</p>	<ul style="list-style-type: none"> - 28% reduction by 2020 (2008 baseline) for federal activities for scope 1 and 2 emissions (excluding federal lands energy) - Agencies set emissions reduction targets for FY2020 for two types of GHG emissions (excluding federal lands energy) - Set overall target of 13% reductions in scope 3 emissions by FY2020 (off FY2008 baseline) for six types of indirect emissions: employee commuting, business air travel, business ground travel, transmission, and distribution losses from purchased electricity use, contracted solid waste disposal and contracted waste water treatment 	<p>-</p>
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From: Minor, Kathleen
To: [Nada Culver](#)
Cc: [Christopher Knauf](#); [Edward Grenham](#); [Evan Frost](#); [George Sexton](#); [Jay Lininger](#); atwood@biologicaldiversity.org; dh@oregonwild.org; [Kristi Mastrofini](#); [Joel Brumm](#); sodamtn@mind.net
Subject: GIS data for CSNM Transportation Management Plan
Date: Friday, July 29, 2016 2:41:48 PM
Attachments: [GIS Data for Appellants.zip](#)

Dear Nada:

Attached is the GIS data that was used for the Cascade-Siskiyou National Monument Draft Transportation Management Plan and Environmental Assessment. I have also included an Excel file titled "Data Key" that will help in determining which field in the shapefiles are relevant and a brief description of what each shapefile includes. I hope this will be helpful, but if you have questions about the data, please feel free to give me a call.

Kathy Minor
Assistant Field Manager

Ashland Resource Area
Medford Bureau of Land Management
kminor@blm.gov <<mailto:kminor@blm.gov>>
541.618.2245

Attachment 2016-07-29 14_41_48 Minor, Kathleen - GIS data for CSNM Transpor. (0 Bytes) cannot be converted to PDF format.

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From: Boyd, David
To: [David Boyd](#)
Subject: News Release: BLM Takes Next Step Toward Resolving Thompson Divide Issues
Date: Friday, July 29, 2016 3:07:39 PM
Attachments: [65 lease NewsRelease.7.29.2016.pdf](#)

News Release
Colorado River Valley Field Office, Colorado

FOR IMMEDIATE RELEASE Date: July 29, 2016
Contacts: David Boyd, Public Affairs Specialist, 970-876-9008
Steven Hall, BLM Public Affairs Specialist, 303-239-3672

BLM Takes Next Step Toward Resolving Thompson Divide Issues
Plan Responds to Public Concern About Oil and Gas Development in the Thompson Divide Area

SILT, Colo. – The Bureau of Land Management (BLM) today released the Final Environmental Impact Statement (EIS) analyzing 65 oil and gas leases that had been issued on the White River National Forest from 1995 to 2012. The BLM's Preferred Alternative in the Final EIS would cancel the 25 undeveloped leases within the area known as the Thompson Divide; apply new stipulations to the remaining leases that are not currently producing oil or gas; and make no or only minor adjustments for leases that are producing.

“The BLM's proposed action strikes the right balance in land management,” said BLM Colorado State Director Ruth Welch. “It respects last year's decision by the U.S. Forest Service (USFS) to maintain the character of the White River National Forest while also facilitating oil and gas development.”

The 65 oil and gas leases analyzed in today's Final EIS are entirely on lands managed by the White River National Forest. The Final EIS addresses deficiencies in the environmental analyses and the process used to support the issuance of those leases.

“We appreciate all the work that the local community has put into this process,” added Welch. “Working together we have been able to address the public's concern with oil and gas development in this remarkable area.”

Since the leases in question are under surface lands managed by the USFS, it is the USFS's role to determine which of those lands are available for oil and gas leasing and to take the lead in conducting the environmental analysis needed to support those decisions. The BLM must either formally adopt the USFS's analysis or perform its own before leasing the public's mineral resources under National Forest System Lands. Since the BLM did not formally adopt the USFS's analysis or conduct its own prior to issuing any of the 65 leases, it had to undertake the analysis being finalized today.

The Preferred Alternative is consistent with the decision made by the USFS in their recently completed EIS that looked at future leasing in the White River National Forest. The BLM's Final EIS incorporates much of the information and analysis generated by the USFS. The Final EIS is available at: <http://www.blm.gov/co/crvfo>. Publication of the Notice of Availability of the Final EIS will occur next Friday, August 5, 2016. The notice will start a 30-day availability period for the EIS, with a Record of Decision expected early in the fall.

###

The BLM manages more than 245 million acres of public land, the most of any Federal agency. This land, known as the National System of Public Lands, is primarily located in 12 Western states, including Alaska. The BLM also administers 700 million acres of sub-surface mineral estate throughout the nation. With a total workforce of over 10,000 employees, the BLM's mission is to manage and conserve the public lands for the use and enjoyment of present and future generations under our mandate of multiple-use and sustained yield. In Fiscal Year 2014, the BLM

generated \$5.2 billion in receipts from public lands.

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David Boyd

Bureau of Land Management

Public Affairs Specialist

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(970) 319-4130 (cell)



News Release

Colorado River Valley Field Office, Colorado

FOR IMMEDIATE RELEASE

Date: July 29, 2016

Contacts: David Boyd, Public Affairs Specialist, 970-876-9008
Steven Hall, BLM Public Affairs Specialist, 303-239-3672

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From: dboyd@blm.gov
To: wrnleases@blm.gov
Subject: NOA on FEIS for Previously Issued Leases in the WRNF
Date: Friday, July 29, 2016 3:23:49 PM

The Notice of Availability (NOA) for the Final Environmental Impact Statement on Previously Issued Oil and Gas Leases in the White River National Forest publishes in the Federal Register on August 5, 2016. The NOA begins a 30 day availability period that will extend to September 4, 2016.

The Final EIS is available on-line at: www.blm.gov/co/crvfo.

For additional information, contact:

Email: WRNFleases@blm.gov

Phone: (970) 876-9000

Mail: BLM Colorado River Valley Field Office, Attn: WRNF Leases, 2300 River Frontage Road, Silt, CO 81652"

From: Sauls, Heather
To: [Luke Schafer](mailto:Luke.Schafer); [Soren Jespersen](mailto:Soren.Jespersen); jim.alexee@sierraclub.org; rich.levy@rmc.sierraclub.org; megan@rockymountainwild.org; jennifer@voiceforthewild.org; steve@suwa.org
Cc: [Kent Walter](mailto:Kent.Walter); [Lauren Brown](mailto:Lauren.Brown); [Kyle Arnold](mailto:Kyle.Arnold); [Erin Jones](mailto:Erin.Jones); [Joseph Meyer](mailto:Joseph.Meyer)
Subject: WRFO Review of External ACEC Nominations
Date: Thursday, August 4, 2016 4:02:51 PM
Attachments: [2016.08.01_Review_of_ACEC_Nominations.pdf](#)

To whom it may concern,

We are contacting you because either you or someone in your organization had previously nominated areas for the BLM to consider as potential ACECs within the White River Field Office.

In April 2015, Rocky Mountain Wild submitted a protest to the BLM Director on the Proposed Oil and Gas Development RMPA/Final EIS. The protest issue involved Areas of Critical Environmental Concern (ACEC) nominations that they submitted in 2003 and 2007. The BLM Director granted their protest and acknowledged that the BLM failed to conduct a timely evaluation of their ACEC nominations within the White River Field Office.

In the Record of Decision for the Oil and Gas Development RMPA, the BLM committed to evaluate these nominated areas to determine whether they satisfy the relevance and importance criteria consistent with BLM's planning regulations and to provide interim management for those areas found to meet the criteria.

We have completed our review of these nominated areas and determined that four areas should be considered potential ACECs. We have also identified interim management for these potential ACECs until we determine whether or not all, or a portion, of these areas should be designated as ACECs during a RMP revision.

I've attached a copy of our ACEC evaluations which also include maps and interim management for the four proposed ACECs.

Please don't hesitate to call if you have any questions!

Thanks!
- Heather

Heather Sauls
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BLM White River Field Office
970-878-3855
hsauls@blm.gov

**United States Department of the Interior
Bureau of Land Management**

Review of External ACEC Nominations

August 1, 2016

U.S. Department of the Interior
Bureau of Land Management
Northwest District
White River Field Office
220 East Market St
Meeker, CO 81641

BLM



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1. INTRODUCTION

1.1. Background

Rocky Mountain Wild (formerly the Center for Native Ecosystems) submitted a protest to the BLM Director in April 2015 concerning Areas of Critical Environmental Concern (ACEC) nominations that they submitted in 2003 and 2007. The BLM Director granted their protest and acknowledged that the BLM failed to conduct a timely evaluation of their ACEC nominations within the White River Field Office.

In the Record of Decision for the Oil and Gas Development Resource Management Plan (RMP) Amendment, the BLM committed to evaluate these nominated areas by August 17, 2016 to determine whether they satisfy the relevance and importance criteria consistent with BLM's planning regulations and to provide interim management for those areas found to meet the criteria.

While not part of the protest, the BLM is also evaluating ACEC nominations submitted by the Colorado Wilderness Network in 2006.

1.2. ACEC Evaluation Process

The Federal Land Policy and Management Act of 1976 (FLMPA) defines ACECs as “areas within the public lands where special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards” (Section 103(a)).

Members of the public may nominate (recommend) an area for consideration as a potential ACEC. The BLM must first review the nominated areas to determine if they meet the relevance and importance criteria. Relevance means that “There shall be present a significant historic, cultural, or scenic value; a fish or wildlife resource or other natural resource system or process; or natural hazard” (43 CFR 1610.7-2(a)(1)). Importance means: “The above described value, resource, system, process, or hazard shall have substantial significance and values. This generally requires qualities of more than local significance and special worth, consequence, meaning, distinctiveness, or cause for concern. A natural hazard can be important if it is a significant threat to human life or property” (43 CFR 1610.7-2(a)(2)). The BLM's ACEC Manual provides additional guidance on how to determine if an area meets the relevance and importance criteria (BLM Manual 1613, Section 0.1(.11)).

All areas which meet the relevance and importance criteria must be identified as potential ACECs (BLM Manual 1613, Section 0.2(.21)). The District Manager must either initiate a plan amendment to further evaluate the potential ACECs or provide temporary (interim) management

until an evaluation is completed through a land use planning effort. Temporary management includes those “reasonable measures necessary to protect human life and safety or significant resource values from degradation until the areas is fully evaluated” through a land use planning process (BLM Manual 1613, Section 0.2(.21)(E)).

Designation of ACECs can only be done through the land use planning process, either during a RMP revision or in a plan amendment.

1.3. Overview of ACEC Nominations

On January 21, 2003, the Center for Native Ecosystems nominated 25 large white-tailed prairie dog complexes in Colorado, Utah, and Wyoming for consideration as ACECs. Three of these areas are within the WRFO (Coal Oil Basin Complex, the Coyote Basin Subcomplex, and the Wolf Creek Complex).

On September 30, 2006, the Colorado Wilderness Network (which included The Wilderness Society, Colorado Environmental Coalition (now known as Conservation Colorado), the Trappers Lake Group of the Sierra Club, and the Rocky Mountain Chapter of the Sierra Club) nominated five areas to be considered as special recreation management areas (SRMAs) and three areas to be considered as ACECs. The proposed ACECs included Bitter Creek as well as additions to the existing Oil Spring Mountain ACEC and East Douglas Creek ACEC.

On March 9, 2007, the Center for Native Ecosystems nominated the following areas for consideration as ACECs:

- Habitat for the Dudley Bluffs bladderpod and Dudley Bluffs twinpod that is not already within existing ACECs;
- Graham’s penstemon habitat;
- Narrow-stem gilia habitat;
- Colorado Natural Heritage Program Potential Conservation Areas (PCAs):
 - Skinner Ridge PCA;
 - Dudley Bluffs PCA;
 - Raven Ridge PCA
 - Shavetail Park PCA (was formerly part of the Raven Ridge PCA);
 - Upper Cow Creek PCA;
 - East Douglas PCA;
 - Fawn Creek North PCA;
 - Barrel Spring Point PCA;
 - South Cathedral Bluffs PCA;
 - Round Top Mountain PCA; and
 - Stuntz Reservoir PCA;
- Greater sage-grouse leks plus four-mile buffers; and
- Large white-tailed prairie dog complexes (greater than 5,000 acres).

To aid in evaluation of the nominated areas, some of the nominations were combined as follows:

- All white-tailed prairie dog complexes;
- Dudley Bluffs PCA and habitat for Dudley Bluffs bladderpod and Dudley Bluffs twinpod;
- Raven Ridge PCA and habitat for Graham's penstemon; and
- Stuntz Reservoir and narrow-leaf evening primrose habitat.

We did not evaluate areas that overlapped with existing (designated) ACECs. For example, the South Cathedral Bluffs PCA is wholly contained within the boundaries of the existing South Cathedral Bluffs ACEC. The East Douglas PCA is also located within the existing East Douglas Creek ACEC.

We also did not evaluate the Skinner Ridge PCA as it is contained within habitat for greater sage-grouse that was evaluated during the Northwest Colorado Greater Sage-Grouse RMP Amendment (see Section 2.13).

We did not evaluate split-estate lands. In this case, the split-estate refers to private surface with federal mineral estate. Since FLPMA defines ACECs as "areas within the public lands where special management attention is required" (Section 103(a)), it does not authorize the BLM to designate private lands overlying federal subsurface as an ACEC (based on surface resource values), as such lands are outside of BLM's jurisdiction to manage. If the BLM were to consider designating subsurface areas as an ACEC, it would be necessary to demonstrate how those federal mineral resources met the relevance and importance criteria and that they required special management attention. Although ACEC designation of BLM-managed subsurface minerals underlying private surface is not appropriate when the special management prescriptions only apply to the surface lands, the BLM may consider resource values on these private surface lands when making land use allocations and decisions relating to federal minerals.

All of the nominated areas that were further evaluated by the BLM are shown on Figure 1.

Table 1. Overall Acreage for Each ACEC Nomination

Nominated Area	Acreage
Dudley Bluffs PCA and <i>Physaria</i> Habitat	36,219
Narrow-Stem Gilia Habitat	246
Stuntz Reservoir PCA	858
Roundtop Mountain PCA	36
Raven Ridge PCA and Penstemon Habitat	18,103
Shavetail Park PCA	10,179
White-tailed Prairie Dog Complexes	164,474
East Douglas Additions	4,772
Oil Spring Mtn Additions	6,885
Upper Cow Creek PCA	4,360
Fawn Creek North PCA	25
Bitter Creek	11,169
Barrel Spring Point PCA	219
Total	257,545

2. EVALUATION OF ACEC NOMINATIONS

2.1. Dudley Bluffs PCA and *Physaria* Habitat

2.1.1. Description of the Area Evaluated

The Dudley Bluffs PCA and *Physaria* habitat nomination area is approximately 36,219 acres (Figure 2). It includes occupied populations of Dudley Bluffs bladderpod (*Physaria congesta*) and Dudley Bluffs twinpod (*Physaria obcordata*) outside of the Dudley Bluffs PCA (buffered by 300 ft).

2.1.2. Relevance Criteria

An area meets the “relevance” criterion if it contains one or more of the following:

1. A significant historic, cultural, or scenic value (including but not limited to rare or sensitive archeological resources and religious or cultural resources important to Native Americans).

Yes. The area of the proposed PCA and *Physaria* habitat has a very high concentration of archaeological and historic resources, a number of which meet the National Register of Historic Places (NRHP) eligibility criterion indicating site significance. Further, this area is located within a larger area identified by the Ute Tribes as part of their ancestral homeland. Contemporary Native American groups such as the Ute Tribes of the Uinta and Ouray Bands

(Northern Ute), Southern Ute, and Ute Mountain Ute Tribes maintain cultural ties to the land and resources within the Piceance Basin.

No. The BLM uses the Visual Resource Management (VRM) system to identify and evaluate an area's scenic values and to determine appropriate management objectives for those values. This area was assessed a Visual Resource Inventory (VRI) rating of Class IV, the lowest valued type of landscape. Overall, this area is not found to have significant scenic value.

2. A fish and wildlife resource (including but not limited to habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).

Yes. The area provides habitat for dozens of migratory bird species including BLM sensitive Brewer's sparrow. Additionally it supports a variety of big game and nongame species and is classified by Colorado Parks and Wildlife (CPW) as mule deer severe winter range. Both Yellow Creek and Piceance Creek support populations of BLM sensitive northern leopard frog. Populations of midget faded rattlesnake (BLM sensitive species) occur in appropriate rock outcrops below 7,000 ft. Flannelmouth and mountain sucker, both BLM sensitive species, as well as native speckled dace occur in Piceance Creek.

3. A natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities which are terrestrial, aquatic, or riparian; or rare geological features).

Yes. The Proposed PCA and *Physaria* habitat nomination area does include Dudley Bluffs Bladderpod and Dudley Bluffs Twinpod which are listed as threatened under the Endangered Species Act (ESA). Occupied plant habitat was buffered by 300 feet, and occupied habitat that was already within an existing ACEC was excluded from the proposal. Based on the buffers, there is approximately 1,615 acres of buffered occupied habitat within the proposed ACEC boundary.

4. Natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action may meet the relevance criteria if it is determined through the resource management planning process that it has become part of a natural process.

No.

2.1.3. Importance Criteria

The value, resource, system, process, or hazard described above must have substantial significance and values in order to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

1. Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.

Yes. Native American groups have indicated through past consultations that this area is an important part of their heritage, as a former homeland, and plays a significant role in maintaining tribal history and cultural identity.

No. The big sagebrush, mountain shrub and pinyon-juniper communities within the proposed parcels are widely distributed throughout the resource area. There are no narrowly endemic or highly specialized wildlife species that are known to inhabit the project area. With regards to aquatic habitats, BLM administers approximately nine percent of Piceance Creek. Given the circumstances of land ownership, BLM management would not be expected to have substantial influence on this system.

2. Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.

Yes. These plants have a very specific habitat niche that occurs only in the Piceance Basin. They primarily occur on sparsely vegetated barren shale slopes of the Thirteen Mile Creek Tongue of the Green River Formation.

Yes. Archaeological resources, particularly those constructed of wood, are considered fragile, irreplaceable, and very vulnerable to adverse change such as might occur during project development. These types of archaeological resources are particularly threatened by wildland fire and firewood collecting. Furthermore, ongoing development in the region makes these resources vulnerable to adverse change.

3. Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.

Yes. Both of the *Physaria* species are listed as threatened under the ESA.

4. Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.

No.

5. Poses a significant threat to human life and safety or to property.

No.

2.2. Narrow-stem Gilia Habitat

2.2.1. Description of the Area Evaluated

The known populations of narrow-stem gilia (*Gilia stenothyrsa*) were buffered by 300 ft to identify the nomination area. The nomination area is approximately 246 total acres (Figure 3). The largest population is found on the border between Rio Blanco County and Uintah County near Gilsonite Draw and Weaver Ridge. There are also small, isolated populations: 1) east of Raven Ridge (included in the Raven Ridge PCA nominated area); 2) north of the Moffat County/Rio Blanco County line along Stinking Water Creek; and 3) adjacent to the Lower Greasewood Creek ACEC.

2.2.2. Relevance Criteria

An area meets the “relevance” criterion if it contains one or more of the following:

1. A significant historic, cultural, or scenic value (including but not limited to rare or sensitive archeological resources and religious or cultural resources important to Native Americans).

No. There are no known, recorded or resources identified by Native Americans as being of interest in the proposed area.

No. Of the four population areas identified all areas were assessed a VRI rating of Class IV, the lowest valued type of landscape, except the Lower Greasewood population which was assessed a VRI of Class III, a moderately valued area. Overall, these four areas are not found to have significant scenic value.

2. A fish and wildlife resource (including but not limited to habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).

Yes. These parcels provides habitat for big game and nongame species including BLM sensitive Brewer’s sparrow. The parcels are largely encompassed by big game severe winter range or general winter range, as classified by CPW.

3. A natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities which are terrestrial, aquatic, or riparian; or rare geological features).

Yes. These parcels contain occupied habitat for narrow-stem gilia which is classified as a BLM sensitive plant species.

4. Natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action may meet the relevance criteria if it is determined through the resource management planning process that it has become part of a natural process.

No.

2.2.3. Importance Criteria

The value, resource, system, process, or hazard described above must have substantial significance and values in order to satisfy the “importance” criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

1. Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.

No. The big sagebrush, mountain shrub and pinyon-juniper communities within the proposed parcels are widely distributed throughout the resource area. There are no narrowly endemic or highly specialized wildlife species that are known to inhabit the project area.

2. Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.

No. The nominated parcels contain occupied habitat for narrow-stem gilia which is classified by the Colorado Natural Heritage Program (CNHP) as G3/S1 (See CNHP Network Ranking System). In general this means the “accepted global” ranking is vulnerable, and the State ranking is imperiled. Based on the general global ranking and abundance in the Uintah basin, it was determined that these populations are not unique and would not meet the importance criteria.

3. Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.

No.

4. Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.

No.

5. Poses a significant threat to human life and safety or to property.

No.

2.3. Stuntz Reservoir PCA

2.3.1. Description of the Area Evaluated

The Stuntz Reservoir PCA and narrowleaf evening primrose (*Oenothera acutissima*) habitat nomination area is approximately 858 acres (Figure 4). The PCA area includes occupied populations of narrowleaf evening primrose that are buffered by 300 ft.

2.3.2. Relevance Criteria

An area meets the “relevance” criterion if it contains one or more of the following:

1. A significant historic, cultural, or scenic value (including but not limited to rare or sensitive archeological resources and religious or cultural resources important to Native Americans).

Yes. Currently, there is little cultural resource inventory in the area of the proposed Stuntz Reservoir PCA and narrowleaf evening primrose habitat. However, based existing data in the region, the Stuntz Reservoir PCA has a potential to contain a very high concentration of archaeological and historic resources, a number of which will meet the NRHP eligibility significance criterion.

No. This area was assessed a VRI rating of Class IV, the lowest valued type of landscape. Overall, this area is not found to have significant scenic value.

2. A fish and wildlife resource (including but not limited to habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).

Yes. These parcels provides habitat for big game and nongame species including BLM sensitive Brewer’s sparrow. The upper elevation big sagebrush and mountain shrub communities are classified as big game summer range. Both parcels are located within a priority habitat management area (PHMA) for greater sage-grouse, with a roughly 20 bird lek located in the larger of the two parcels.

3. A natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities which are terrestrial, aquatic, or riparian; or rare geological features).

Yes. The Stuntz Reservoir PCA does contain occupied habitat for narrowleaf evening primrose.

4. Natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action may meet the relevance criteria if it is determined through the resource management planning process that it has become part of a natural process.

No.

2.3.3. Importance Criteria

The value, resource, system, process, or hazard described above must have substantial significance and values in order to satisfy the “importance” criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

1. Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.

No. The big sagebrush and mountain shrub communities within the proposed parcels are widely distributed throughout the resource area. There are no narrowly endemic or highly specialized wildlife species that are known to inhabit the project area. Greater sage-grouse and PHMAs are addressed in Section 2.14.

No. While cultural resources that meet NRHP eligibility criteria can be found within the Stuntz Reservoir PCA, these resources types are found throughout the field office and are protected by existing laws and regulations.

2. Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.

No. The proposed PCA does contain one small population of narrowleaf evening primrose which is the only known population in the White River Field Office (WRFO). The species is classified by CNHP as G2/S2 which means it is imperiled globally and in the state of Colorado. Narrow leaf evening primrose is known to occur in Moffat County in Colorado around Cold Spring Mountain and Douglas Mountain along the eastern end of the Uinta Mountains and the one population on Blue Mountain. It is also known to occur in Utah in Daggett, Uintah, and Duchesne counties. Due to the overall abundance and distribution of the species, this area does not meet the importance criteria.

No. While cultural resources are considered fragile and irreplaceable resources that are generally vulnerable to adverse change, existing management protection and existing law and regulations are adequate.

3. Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.

No.

4. Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.

No.

5. Poses a significant threat to human life and safety or to property.

No.

2.4. Roundtop Mountain PCA

2.4.1. Description of the Area Evaluated

Approximately 36 acres of the Roundtop Mountain PCA are located on BLM-managed lands (Figure 5).

2.4.2. Relevance Criteria

An area meets the “relevance” criterion if it contains one or more of the following:

1. A significant historic, cultural, or scenic value (including but not limited to rare or sensitive archeological resources and religious or cultural resources important to Native Americans).

No. Currently, no cultural resource inventory data exist in the Roundtop Mountain PCA, however given the small acreage of the PCA there is little chance for the PCA to contain significant cultural resources.

No. This area was assessed a VRI rating of Class II, the highest valued type of landscape that is not located within a Wilderness area or Wilderness Study Area. Overall, this area is has been found to have scenic value, but this 36 acres is visually similar to the vast surrounding landscape including lands located within the adjacent 210,000 acre Dinosaur National Monument. Therefore this 36 acre area is found to not have significant scenic value.

2. A fish and wildlife resource (including but not limited to habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).

Yes. The entire parcel is located in a PHMA for greater sage-grouse, however only approximately four acres of the proposed PCA has the potential to support sage-grouse and Brewer’s sparrow. The remaining 32 acres is largely barren and likely does not support a strong contingent of big game or nongame species. The parcel is located within big game summer range.

3. A natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities which are terrestrial, aquatic, or riparian; or rare geological features).

No. According to CNHP’s PCA report, the PCA was established as a result of a population of narrowleaf evening primrose. However, the population is entirely in Dinosaur National Monument and there are no known occurrences of narrow leaf evening primrose on BLM-managed lands.

4. Natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action may meet the relevance criteria if it is determined through the resource management planning process that it has become part of a natural process.

No.

2.4.3. Importance Criteria

The value, resource, system, process, or hazard described above must have substantial significance and values in order to satisfy the “importance” criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

1. Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.

No. The big sagebrush communities within the proposed parcel are widely distributed throughout the resource area. There are no narrowly endemic or highly specialized wildlife species that are known to inhabit the project area. Greater sage-grouse and PHMAs are addressed in Section 2.14.

2. Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.

No.

3. Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.

No.

4. Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.

No.

5. Poses a significant threat to human life and safety or to property.

No.

2.5. Raven Ridge PCA and Graham’s Penstemon Habitat

2.5.1. Description of the Area Evaluated

The Raven Ridge PCA and Graham’s Beardtongue (*Penstemon grahamii*) habitat nomination area is approximately 18,103 acres (Figure 6). It includes occupied populations of narrow-stem

gilia, Graham's beardtongue, and a small population of Graham's beardtongue to the south of the PCA along the Colorado/Utah border. The occupied population of narrow-stem gilia was buffered by 300 ft. The occupied populations of Graham's beardtongue were buffered by a half mile.

2.5.2. Relevance Criteria

An area meets the "relevance" criterion if it contains one or more of the following:

1. A significant historic, cultural, or scenic value (including but not limited to rare or sensitive archeological resources and religious or cultural resources important to Native Americans).

Yes. The proposed PCA has a number of cultural resources that are considered significant under the NRHP eligibility criteria. The PCA also contains identified cultural resources that are considered significant to contemporary Native American groups.

No. This area was assessed a VRI rating of Class IV, the lowest valued type of landscape. A lands with wilderness characteristics unit is located within the southern portion of the area, but scenic value was not found to be a significant supplemental value in that unit.

2. A fish and wildlife resource (including but not limited to habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).

Yes. The area provides habitat for several of migratory bird species including BLM sensitive Brewer's sparrow, burrowing owl, and ferruginous hawk. Additionally it supports a variety of big game and nongame species, and is classified by CPW as mule deer general winter range. Greater sage-grouse general habitat management areas (GHMA) occur within the larger parcel. BLM sensitive white-tailed prairie dog colonies, which also provide habitat for black-footed ferret, are also located in the larger parcel.

3. A natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities which are terrestrial, aquatic, or riparian; or rare geological features).

Yes. The proposed PCA does contain populations of Graham's beardtongue and narrow-stem gilia. Both of the species are classified as BLM sensitive species.

4. Natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action may meet the relevance criteria if it is determined through the resource management planning process that it has become part of a natural process.

No.

2.5.3. Importance Criteria

The value, resource, system, process, or hazard described above must have substantial significance and values in order to satisfy the “importance” criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

1. Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.

No. The big sagebrush and pinyon-juniper communities within the proposed parcels are widely distributed throughout the resource area. There are no narrowly endemic or highly specialized wildlife species that are known to inhabit the project area. White-tailed prairie dog complexes are addressed in section 2.7.3.

Yes. Cultural resources that meet NRHP eligibility criteria can be considered significant at the local, state or national level depending on the nature of the site and the remains present. The sites may provide information regarding the human occupation and adaptation to the area through history. Native American groups have indicated that sites in this area are important part of their heritage and play a significant role in maintaining tribal history and cultural identity. There are known register-eligible sites within the nominated area.

2. Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.

Yes. Cultural resources are considered fragile, irreplaceable resources that are generally vulnerable to adverse change such as construction activities, grazing, artifact collecting and events of excessive erosion.

Yes. Two BLM sensitive species (narrow-stem gilia and Graham’s beardtongue) occur within this PCA boundary. Narrow-stem gilia is classified by CNHP as G3/S1. This means that it is globally vulnerable and critically imperiled in the state. Graham’s beardtongue is classified as G2/S1. This means that the species is globally imperiled and critically imperiled in the state.

3. Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.

Yes. Graham’s beardtongue was previously listed proposed for listing under the ESA; however multiple stakeholders in conjunction with the United State Fish and Wildlife Service (FWS) developed a Conservation Agreement to prevent listing the species under ESA while continuing to conserve the species.

4. Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.

No.

5. Poses a significant threat to human life and safety or to property.

No.

2.6. Shavetail Park PCA

2.6.1. Description of the Area Evaluated

In 2007 the Center for Native Ecosystems recommended that the BLM expand the boundaries of the Raven Ridge ACEC to include the Raven Ridge PCA (shown as “original nominated area” on Figure 6. Shavetail Park PCA ACEC Nomination and Raven Ridge PCA and Graham’s Penstemon Habitat ACEC Nomination). Since then, the Colorado Natural Heritage Program has updated its PCA boundaries to expand the areas included and to split the area into two distinct PCAs. Portions of the original nomination area are now within the Raven Ridge PCA (north of the White River) and the Shavetail Park PCA (south of the river). The BLM included the small parcels south of the river that were in the original nominated area (but outside the current PCA boundary) as part of this evaluation of the Shavetail Park PCA (10,179 acres).

2.6.2. Relevance Criteria

An area meets the “relevance” criterion if it contains one or more of the following:

1. A significant historic, cultural, or scenic value (including but not limited to rare or sensitive archeological resources and religious or cultural resources important to Native Americans).

Yes. The proposed PCA has a number of cultural resources that are considered significant under the NRHP eligibility criteria. The PCA also contains identified cultural resources that are considered significant to contemporary Native American groups.

No. This area was assessed a VRI rating of Class IV, the lowest valued type of landscape. Portions of two lands with wilderness characteristics units (Shavetail Wash and Banta Ridge) are located within the northern section of the area. While the lands with wilderness characteristics inventories for both units describe both areas as offering expansive scenic views, similar views can be found throughout this landscape. Overall this area is found to not have significant scenic value.

2. A fish and wildlife resource (including but not limited to habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).

Yes. The area provides habitat for several of migratory bird species including BLM sensitive Brewer’s sparrow. Additionally it supports a variety of big game and nongame species, and is classified by CPW as mule deer severe winter range. Greater sage-grouse GHMAs occur within the parcel. Other BLM sensitive species that may occur within the proposed PCA include white-tailed prairie dog and midget faded rattlesnake.

3. A natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities which are terrestrial, aquatic, or riparian; or rare geological features).

Yes. The Shavetail Park PCA contains occupied habitat for White River penstemon.

4. Natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action may meet the relevance criteria if it is determined through the resource management planning process that it has become part of a natural process.

No.

2.6.3. Importance Criteria

The value, resource, system, process, or hazard described above must have substantial significance and values in order to satisfy the “importance” criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

1. Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.

No. The big sagebrush and salt desert shrub communities within the proposed parcel are widely distributed throughout the resource area. There are no narrowly endemic or highly specialized wildlife species that are known to inhabit the project area. This area historically supported sage-grouse but does not currently support, nor has in recent decades supported any notable grouse use. Remnant white-tailed prairie dog colonies are small and discontinuous (see Section 2.7.3).

Yes. Cultural resources that meet NRHP eligibility criteria can be considered significant at the local, state or national level depending on the nature of the site and the remains present. The sites may provide information regarding the human occupation and adaptation to the area through history. Native American groups have indicated that sites in this area are important part of their heritage and play a significant role in maintaining tribal history and cultural identity.

2. Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.

Yes. This PCA does contain two populations of White River penstemon. This species is classified as G4T1/S1. This means that the population is apparently secure with subspecies that are critically imperiled. It is classified as critically imperiled in the state.

Another species driving the site rank is the presence ephedra buckwheat (*Eriogonum ephedroides*). This species is classified as G3/S1. Due to relative abundance throughout the Uintah Basin, it was determined that this species is not so unique that, on its own, it would meet the importance criteria.

Yes. Cultural resources are considered fragile, irreplaceable resources that are generally vulnerable to adverse change such as construction activities, grazing, artifact collecting and events of excessive erosion.

3. Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.

Yes. White River beardtongue was previously proposed for listing under the ESA; however multiple stakeholders in conjunction with the FWS developed a Conservation Agreement to prevent listing the species under ESA while continuing to conserve the species.

4. Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.

No.

5. Poses a significant threat to human life and safety or to property.

No.

2.7. White-Tailed Prairie Dog Complexes

2.7.1. Description of the Area Evaluated

The BLM evaluated 164,474 acres of white-tailed prairie dog complexes (Figure 7). The areas evaluated were delineated by first consolidating current WRFO prairie dog mapping of all habitats showing evidence of current or former occupation (Biggins et. al. 1993) and buffering these areas by a half mile. The acreage was then refined by removing the following: 1) defunct populations that have not been robust since the mid-1970s and are separated from core WRFO prairie dog distribution by a substantive barrier (e.g., Shavetail Wash), 2) small population segments substantively isolated from core WRFO prairie dog distribution and better associated with the adjacent LSFO (e.g., Sagebrush Creek), and 3) margins trimmed to line-of-sight terrain relief when the buffer was comprised of unsuitable woodland or rock outcrop habitat (e.g., north of US Highway 40, Pinyon Ridge).

2.7.2. Relevance Criteria

An area meets the “relevance” criterion if it contains one or more of the following:

1. A significant historic, cultural, or scenic value (including but not limited to rare or sensitive archeological resources and religious or cultural resources important to Native Americans).

Yes. The proposed area has a number of cultural resources that are considered significant under the NRHP eligibility criteria. The area also contains identified cultural resources that are considered significant to contemporary Native American groups.

No. These vast areas or complexes were assessed a VRI rating of Class IV, the lowest valued type of landscape, except for a few small areas. One of approximately 2,350 acres is located within Skull Creek Wilderness Study Area (WSA) and is assessed by policy a VRI rating of Class I, highest valued BLM landscapes. However, the white-tailed prairie dog complex boundaries were delineated based on prairie dog habitat and not on scenic value. Therefore scenic ridges and drainages are bisected by this area's boundary without regard to the contiguous scenic quality found in this area. Therefore no areas in these complexes have been found to possess significant scenic value.

2. A fish and wildlife resource (including but not limited to habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).

Yes. A variety of big game and nongame species occur within the proposed parcels, most notably BLM sensitive white-tailed prairie dogs and their associates. White-tailed prairie dog colonies provide habitat for several other BLM sensitive species including black-footed ferret, burrowing owl, ferruginous hawk, and Brewer's sparrow. The parcels are largely coincident with both PHMA and GHMA for greater sage-grouse. A sage-grouse lek (60-70 males) is located in one of the proposed parcels. These parcels are encompassed by big game winter (including severe winter) ranges.

3. A natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities which are terrestrial, aquatic, or riparian; or rare geological features).

Yes. The area does include 10 populations of debris milkvetch (*Debris milkvetch*) totaling 45.8 acres.

4. Natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action may meet the relevance criteria if it is determined through the resource management planning process that it has become part of a natural process.

No.

2.7.3. Importance Criteria

The value, resource, system, process, or hazard described above must have substantial significance and values in order to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

1. Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.

No. The described area encompasses over 90 percent of white-tailed prairie dog habitat in the WRFO and forms the basis for WRFO's involvement with efforts to reintroduce black-footed ferret in the Northeast Utah/Northwest Colorado nonessential, experimental population area

(ExPA) that was established in 1998. It is estimated that the 60,000 contiguous acres of prairie dog habitat within this area accounts for about 26 percent of the prairie dog habitat associated with the Northeast Utah/Northwest Colorado ExPA. Prairie dog populations and the amount of occupied habitat within the area have fluctuated significantly over the last 40 years and recurrent bouts of epidemic disease have been the most serious impediment in establishing a self-sustaining ferret population in the Northeast Utah/Northwest Colorado ExPA. Existing management in the 1997 RMP and 2015 Oil and Gas RMP Amendment provides an established suite of avoidance, minimization, and compensatory mitigation measures that are intended to maintain the utility and extent of black-footed ferret habitat and their white-tailed prairie dog habitat base. There have been no substantive changes in land use practices or activities within this area since development of the cooperative ferret management plan in 2001 and the potential for adversely affecting prairie dog populations or habitat in the foreseeable future is considered low.

No. While cultural resources that meet NRHP eligibility significance criteria can be found throughout the proposed PCA, the cultural resources that are most significant within the PCA are currently protected through existing management which provides long term protection for these archaeological sites.

2. Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.

No. Debris milkvetch is a BLM sensitive species classified by CNHP as G3/S2. This means that the species is globally vulnerable and imperiled in the state of Colorado. Due to distribution and relative abundance in Colorado (Moffat and Rio Blanco Counties) and in Utah (Duchesne and Uintah Counties) it was determined that these populations are not special or unique and do not meet the importance criteria.

No. While cultural resources are considered fragile and irreplaceable resources that are generally vulnerable to adverse change, because of existing management protection and established heritage preservation laws and regulations there is not cause for concern to make this area meet the importance criteria.

3. Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.

No.

4. Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.

No.

5. Poses a significant threat to human life and safety or to property.

No.

2.8. East Douglas Creek Addition

2.8.1. Description of the Area Evaluated

The map accompanying the original nomination was lost over time but the proponent provided a detailed description in their nomination that the BLM used to delineate 4,772 acres that could potentially expand the existing East Douglas Creek ACEC (Figure 8). Much of the original nomination included split-estate lands which were not included (see section 1.3).

2.8.2. Relevance Criteria

An area meets the “relevance” criterion if it contains one or more of the following:

1. A significant historic, cultural, or scenic value (including but not limited to rare or sensitive archeological resources and religious or cultural resources important to Native Americans).

No. There are no known or identified cultural, historical, or resources of concern to Native Americans recorded in the proposed ACEC expansion.

No. This area was assessed VRI ratings of Class III and IV, the moderate and lowest valued types of landscapes. Overall this area is found to not have significant scenic value.

2. A fish and wildlife resource (including but not limited to habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).

Yes. These parcels provide habitat for a variety of big game and nongame species including BLM sensitive Brewer’s sparrow and northern goshawk. The higher elevation communities are classified by CPW as big game summer range. The proposed parcels are all located in PHMA for greater sage-grouse. Additionally, several active leks occur within and immediately outside of the proposed parcels.

3. A natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities which are terrestrial, aquatic, or riparian; or rare geological features).

No.

4. Natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action may meet the relevance criteria if it is determined through the resource management planning process that it has become part of a natural process.

No.

2.8.3. Importance Criteria

The value, resource, system, process, or hazard described above must have substantial significance and values in order to satisfy the “importance” criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

1. Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.

No. Half of the acreage within the recommended addition to the East Douglas ACEC is subject to No Surface Occupancy (NSO) stipulations established in the 2015 Oil and Gas RMP Amendment attributable to steep slopes/steep forested slopes (1,400 acres) and sage-grouse lek NSOs (1,238 acres). The remaining acreage is substantially constrained by surface use and activity provisions developed for greater sage-grouse priority habitat in the 2015 Northwest Colorado Greater Sage-Grouse RMP Amendment, including facility density thresholds, surface disturbance caps, and elevated reclamation standards. Therefore, there is not enough cause for concern for this area to meet the importance criteria. Greater sage-grouse and PHMA are discussed in Section 2.14.

2. Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.

No.

3. Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.

No.

4. Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.

No.

5. Poses a significant threat to human life and safety or to property.

No.

2.9. Oil Spring Mountain ACEC Addition

2.9.1. Description of the Area Evaluated

In 2006 the Colorado Wilderness Network proposed expanding the existing Oil Spring Mountain ACEC by approximately 6,885 acres (Figure 9).

2.9.2. Relevance Criteria

An area meets the “relevance” criterion if it contains one or more of the following:

1. A significant historic, cultural, or scenic value (including but not limited to rare or sensitive archeological resources and religious or cultural resources important to Native Americans).

No. There are few recorded cultural resources within the proposed ACEC addition. Of these, two archaeological sites are determined eligible for listing on the NRHP. There are no known Native American religious concerns in the proposed ACEC addition.

No. This area was assessed VRI ratings of Class III and IV, the moderate and lowest valued types of landscapes. Overall this area is found to not have significant scenic value.

2. A fish and wildlife resource (including but not limited to habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).

Yes. These parcels provide habitat for a variety of big game and nongame species including BLM sensitive Brewer’s sparrow and northern goshawk. The parcels are encompassed by big game general winter range.

3. A natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities which are terrestrial, aquatic, or riparian; or rare geological features).

No.

4. Natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action may meet the relevance criteria if it is determined through the resource management planning process that it has become part of a natural process.

No.

2.9.3. Importance Criteria

The value, resource, system, process, or hazard described above must have substantial significance and values in order to satisfy the “importance” criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

1. Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.

No. The big sagebrush, mountain shrub and pinyon-juniper communities within the proposed parcels are widely distributed throughout the resource area. There are no narrowly endemic or highly specialized wildlife species that are known to inhabit the project area.

2. Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.

No.

3. Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.

No.

4. Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.

No.

5. Poses a significant threat to human life and safety or to property.

No.

2.10. Upper Cow Creek PCA

2.10.1. Description of the Area Evaluated

The Upper Cow Creek PCA was mapped by the Colorado Natural Heritage Program in 2001 and contains approximately 9,270 acres on both private surface as well as public lands managed by the BLM's WRFO and Colorado River Valley Field Office. However, the Center for Native Ecosystems only identified approximately 4,360 acres on BLM-managed lands within the WRFO in their nomination (Figure 10).

2.10.2. Relevance Criteria

An area meets the "relevance" criterion if it contains one or more of the following:

1. A significant historic, cultural, or scenic value (including but not limited to rare or sensitive archeological resources and religious or cultural resources important to Native Americans).

No. There are no known or recorded cultural or historical resources, or currently identified areas of Native American concern in the PCA.

No. This area was assessed VRI ratings of Class III and IV, the moderate and lowest valued types of landscapes. Overall this area is found to not have significant scenic value.

2. A fish and wildlife resource (including but not limited to habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).

Yes. This parcel provides habitat for a variety of big game and nongame species including BLM sensitive Brewer's sparrow and northern goshawk. The parcel is broadly encompassed by big game summer range. Greater sage-grouse GHMA is located in the southeast portion of the parcel.

3. A natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities which are terrestrial, aquatic, or riparian; or rare geological features).

No.

4. Natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action may meet the relevance criteria if it is determined through the resource management planning process that it has become part of a natural process.

No.

2.10.3. Importance Criteria

The value, resource, system, process, or hazard described above must have substantial significance and values in order to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

1. Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.

No. The big sagebrush, and to a lesser extent, aspen and Douglas fir communities within the proposed parcel are widely distributed throughout the resource area. There are no narrowly endemic or highly specialized wildlife species that are known to inhabit the project area. The greater sage-grouse GHMA may receive sporadic and incidental use by grouse.

2. Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.

No.

3. Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.

No.

4. Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.

No.

5. Poses a significant threat to human life and safety or to property.

No.

2.11. Fawn Creek North PCA

2.11.1. Description of the Area Evaluated

In 2007 the Center for Native Ecosystems nominated the Fawn Creek North PCA for an ACEC. The majority of the 7,562-acre Fawn Creek North PCA occurs in the White River National Forest. Approximately 25 acres are on BLM-managed lands (Figure 11).

2.11.2. Relevance Criteria

An area meets the “relevance” criterion if it contains one or more of the following:

1. A significant historic, cultural, or scenic value (including but not limited to rare or sensitive archeological resources and religious or cultural resources important to Native Americans).

No. There are no known or recorded cultural or historical resources known on the BLM portion of the proposed PCA. The area is likely too steep for the presence of cultural resources.

No. This area was assessed a VRI rating of Class II, the highest valued types of landscapes, except for Class I areas such as Wilderness areas or Wilderness Study Areas. The scenic quality of this entire area, as nominated, is similar to the surrounding landscape and is less scenic than the landscape up the White River drainage from this area such as Ripple Creek Pass, Trapper’s Lake, and the Flat Tops Wilderness. Overall this area is found to not have significant scenic value.

2. A fish and wildlife resource (including but not limited to habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).

Yes. The parcel provides habitat for a variety of big game and nongame wildlife species including BLM sensitive northern goshawk and Brewer’s sparrow. The higher elevation aspen communities are classified as big game summer range.

3. A natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities which are terrestrial, aquatic, or riparian; or rare geological features).

No.

4. Natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human

action may meet the relevance criteria if it is determined through the resource management planning process that it has become part of a natural process.

Yes. Based on the Natural Resources Conservation Service (NRCS) soil survey of Rio Blanco County (Soil Conservation Service - SCS, 1982) and web-based data (NRCS 2012), 9 out of 25 acres (39 percent) located within the Fawn Creek North PCA are classified as landslide areas.

2.11.3. Importance Criteria

The value, resource, system, process, or hazard described above must have substantial significance and values in order to satisfy the “importance” criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

1. Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.

No. The big sagebrush, and to a lesser extent, the aspen communities within the proposed parcel are widely distributed throughout the resource area. There are no narrowly endemic or highly specialized wildlife species that are known to inhabit the project area.

2. Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.

No. While landslide soils are vulnerable to adverse change resulting from slumping and rotational failure (slope failure by outward and downward movement), these areas are protected by No Surface Occupancy (NSO) stipulations established in the 1997 RMP and the 2015 Oil and Gas RMP Amendment.

3. Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.

No.

4. Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.

No.

5. Poses a significant threat to human life and safety or to property.

No.

2.12. Bitter Creek

2.12.1. Description of the Area Evaluated

In 2006 the Colorado Wilderness Network nominated 131,115 acres in the Bitter Creek area, along the Colorado-Utah border, as an ACEC. The majority of the nominated area is located within the Vernal Field Office in Utah. In Colorado, the nominated areas included lands managed by the Grand Junction Field Office and 11,169 acres managed by the WRFO (Figure 12).

The Vernal Field Office evaluated a potential Bitter Creek ACEC in the 2008 Proposed RMP/Final EIS however the area was not designated as an ACEC in the 2008 Record of Decision/Approved RMP.

2.12.2. Relevance Criteria

An area meets the “relevance” criterion if it contains one or more of the following:

1. A significant historic, cultural, or scenic value (including but not limited to rare or sensitive archeological resources and religious or cultural resources important to Native Americans).

Yes. The proposed area has a number of cultural resources that are considered significant under the NRHP eligibility criteria. There are no known Native American religious concerns in the proposed ACEC.

No. This area was assessed a VRI rating of Class IV, the lowest valued type of landscapes. Overall this area is found to not have significant scenic value.

2. A fish and wildlife resource (including but not limited to habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).

Yes. These parcels provide habitat for a variety of big game and nongame species including Brewer’s sparrow and northern goshawk. Bitter Creek, located in the smaller of the two parcels, provides habitat for native cutthroat.

3. A natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities which are terrestrial, aquatic, or riparian; or rare geological features).

No.

4. Natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action may meet the relevance criteria if it is determined through the resource management planning process that it has become part of a natural process.

Yes. Based on the NRCS soil survey of Rio Blanco county (Soil Conservation Service - SCS, 1982) and web-based data (NRCS 2012), 1,717 out of 11,169 acres (15 percent) located within the Bitter Creek area are classified as landslide areas.

2.12.3. Importance Criteria

The value, resource, system, process, or hazard described above must have substantial significance and values in order to satisfy the “importance” criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

1. Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.

No. The big sagebrush, pinyon-juniper, and to a lesser extent, aspen and Douglas fir communities within the proposed parcels are widely distributed throughout the resource area. There are no narrowly endemic or highly specialized wildlife species that are known to inhabit the project area.

No. While cultural resources are considered fragile and irreplaceable resources that are generally vulnerable to adverse change, because of existing management protection and established heritage preservation laws and regulations there is not cause for concern to make this area meet the importance criteria.

2. Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.

No. While landslide soils are vulnerable to adverse change resulting from slumping and rotational failure (slope failure by outward and downward movement), these areas are protected by No Surface Occupancy (NSO) stipulations established in the 1997 RMP and 2015 Oil and Gas RMP Amendment.

3. Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.

No.

4. Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.

No.

5. Poses a significant threat to human life and safety or to property.

No.

2.13. Barrel Spring Point PCA

2.13.1. Description of the Area Evaluated

The Barrel Spring Point PCA occurs along the boundary between the WRFO and the Grand Junction Field Office (GJFO). A portion of the Barrel Spring Point PCA within the GJFO is included in the Roan and Carr Creeks ACEC. Of the 3,753 acres mapped by the Colorado Natural Heritage Program, 219 acres are on public land managed by the BLM-WRFO and lie between the East Douglas ACEC and the Roan and Carr Creeks ACEC (Figure 13).

2.13.2. Relevance Criteria

An area meets the “relevance” criterion if it contains one or more of the following:

1. A significant historic, cultural, or scenic value (including but not limited to rare or sensitive archeological resources and religious or cultural resources important to Native Americans).

No. There are no cultural or historical resources in the identified area within the WRFO. The terrain is likely too steep for the presence of cultural material.

No. This area was assessed VRI rating of Class III, a moderately valued type of landscapes. Overall this area is found to not have significant scenic value.

2. A fish and wildlife resource (including but not limited to habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).

Yes. These parcels provide habitat for a variety of big game and nongame wildlife species including Brewer’s sparrow and northern goshawk. These parcels are largely encompassed by big game summer range.

3. A natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities which are terrestrial, aquatic, or riparian; or rare geological features).

Yes. The Barrel Spring Point PCA does have occupied habitat for the BLM sensitive species Piceance bladderpod.

4. Natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action may meet the relevance criteria if it is determined through the resource management planning process that it has become part of a natural process.

No.

2.13.3. Importance Criteria

The value, resource, system, process, or hazard described above must have substantial significance and values in order to satisfy the “importance” criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

1. Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.

No. The big sagebrush and, to a lesser extent, aspen communities within the proposed parcels are widely distributed throughout the resource area. There are no narrowly endemic or highly specialized wildlife species that are known to inhabit the project area.

2. Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.

Yes. Piceance bladderpod grows on shale outcrops of the Green River Formation on ledges and slopes of canyons. It is classified as G2/S2 CNHP. This means that is globally imperiled and imperiled in the state of Colorado based on the CNHP description.

3. Has been recognized as warranting protection in order to satisfy national priority concerns or to carry out the mandates of FLPMA.

No.

4. Has qualities which warrant highlighting in order to satisfy public or management concerns about safety and public welfare.

No.

5. Poses a significant threat to human life and safety or to property.

No.

2.14. Greater Sage-Grouse Habitat

In 2007, the Center for Native Ecosystems nominated areas within four miles of greater sage-grouse leks as a potential ACEC. The BLM conducted an evaluation of this area in 2013 when it evaluated both the Audubon’s ACEC proposal and priority habitat management areas and linkage/connectivity habitat management areas (refer to Appendix J of the Northwest Colorado Greater Sage-Grouse Proposed Land Use Plan Amendment/Final Environmental Impact Statement). While sage-grouse habitat was found to meet the relevance and importance criteria, the BLM decided not to designate it as an ACEC in the 2015 Record of Decision and Approved Resource Management Plan Amendments for the Rocky Mountain Region, Including the Greater Sage-Grouse Sub-Regions of Lewistown, North Dakota, Northwest Colorado, and Wyoming.

3. POTENTIAL ACECS

Based on the evaluations above, the BLM has identified that four of the nominated areas meet the relevance and importance criteria and should be considered potential ACECs (Figure 14). To avoid confusion with existing ACECs or differences between the boundaries of CNHP's PCAs, we have modified the descriptive names used to refer to the nominated areas to create names for the potential ACECs (Table 2).

Table 2. Potential ACECs

Nominated Area Descriptive Name	Potential ACEC Name	Acres	Relevant and Important Characteristics
Dudley Bluffs PCA and Physaria Habitat	Physaria	36,219	Cultural resources and special status plants (Federally threatened plants)
Raven Ridge PCA and Graham's Penstemon Habitat	Mormon Gap	18,103	Cultural resources and special status plants (BLM sensitive plants)
Shavetail Park PCA	Shavetail Park	10,179	Cultural resources and special status plants (BLM sensitive plants)
Barrel Spring Point PCA	Barrel Spring Point	219	Special status plants (BLM sensitive plants)

4. INTERIM MANAGEMENT

The BLM intends to decide whether or not to designate all, or a portion, of the potential ACECs as an ACEC when the White River RMP is revised. Rather than immediately preparing a plan amendment to further evaluate these areas, waiting until the RMP revision allows the BLM to evaluate these potential designations concurrently with other potential special designations (such as special recreation management areas).

The BLM will use the follow interim management to protect significant resource values from degradation until these potential ACECs can be fully evaluated during the land use planning process:

1. The BLM will consider the four potential ACECs when discussing potential impacts to resources during both land use planning (e.g., the ongoing Travel Management RMP Amendment) and implementation (project) level NEPA analyses.

2. The BLM will not approve any ground disturbing activities that may affect historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, or Executive Order 13007 until we have completed our obligations under the NHPA and other authorities (such as consultation with Tribes and the State Historic Preservation Officer).
3. The BLM will carefully evaluate any parcels within the four potential ACECs that are nominated for oil and gas lease sales on a case-by-case basis before including them in a proposed sale notice. However, due to the rigorous management developed for special status plants and cultural resources in the 2015 Oil and Gas Development RMP Amendment, the BLM does not anticipate the need to defer any parcels within the four potential ACECs from an oil and gas lease sale.
4. The management in the 2015 Oil and Gas Development RMP Amendment for special status plants applies to occupied, suitable, and potential habitat, regardless of whether those habitats occur within the boundaries of an ACEC. As such, this management applies to special status plant habitat within the potential ACECs (see section 2.11 of the Oil and Gas Development RMP Amendment).
5. Within the Shavetail Park and Mormon Gap potential ACECs, the BLM will follow the conservation actions outlined in the Conservation Agreement and Strategy for Graham's Beardtongue (*Penstemon grahamii*) and White River Beardtongue (*P. scariosus* var. *albifluvis*). The complete Conservation Agreement may be found on the FWS' website¹ and a summary of the conservation actions is included as Appendix B.
6. The BLM will consider the four potential ACECs during alternatives development for any ongoing or future land use planning efforts (such as the Travel Management RMP Amendment) whenever special management is prescribed for designated ACECs.

5. INTERDISCIPLINARY REVIEW

Table 3. List of Preparers

Name	Title	Area of Responsibility
Brian Yaquinto and Michael Selle	Archaeologist	Cultural Resources (including religious and cultural resources important to Native Americans).
Aaron Grimes	Outdoor Recreation Planner	Scenic Values
Ed Hollowed and Lisa Belmonte	Wildlife Biologist	Fish and Wildlife Resources

¹ http://www.fws.gov/mountain-prairie/species/plants/2utahbeardtongues/Penstemon_Conservation_Agreement_2014Jul22_final_signed.pdf

Name	Title	Area of Responsibility
Matthew Dupire and Heather Woodruff	Ecologist	Natural Processes or Systems
Keith Sauter	Hydrologist	Natural Hazards
Heather Sauls	Planning & Environmental Coordinator	Project Lead

APPENDIX A. FIGURES

Figure 1. Overview Figure of All Existing and Nominated ACECs

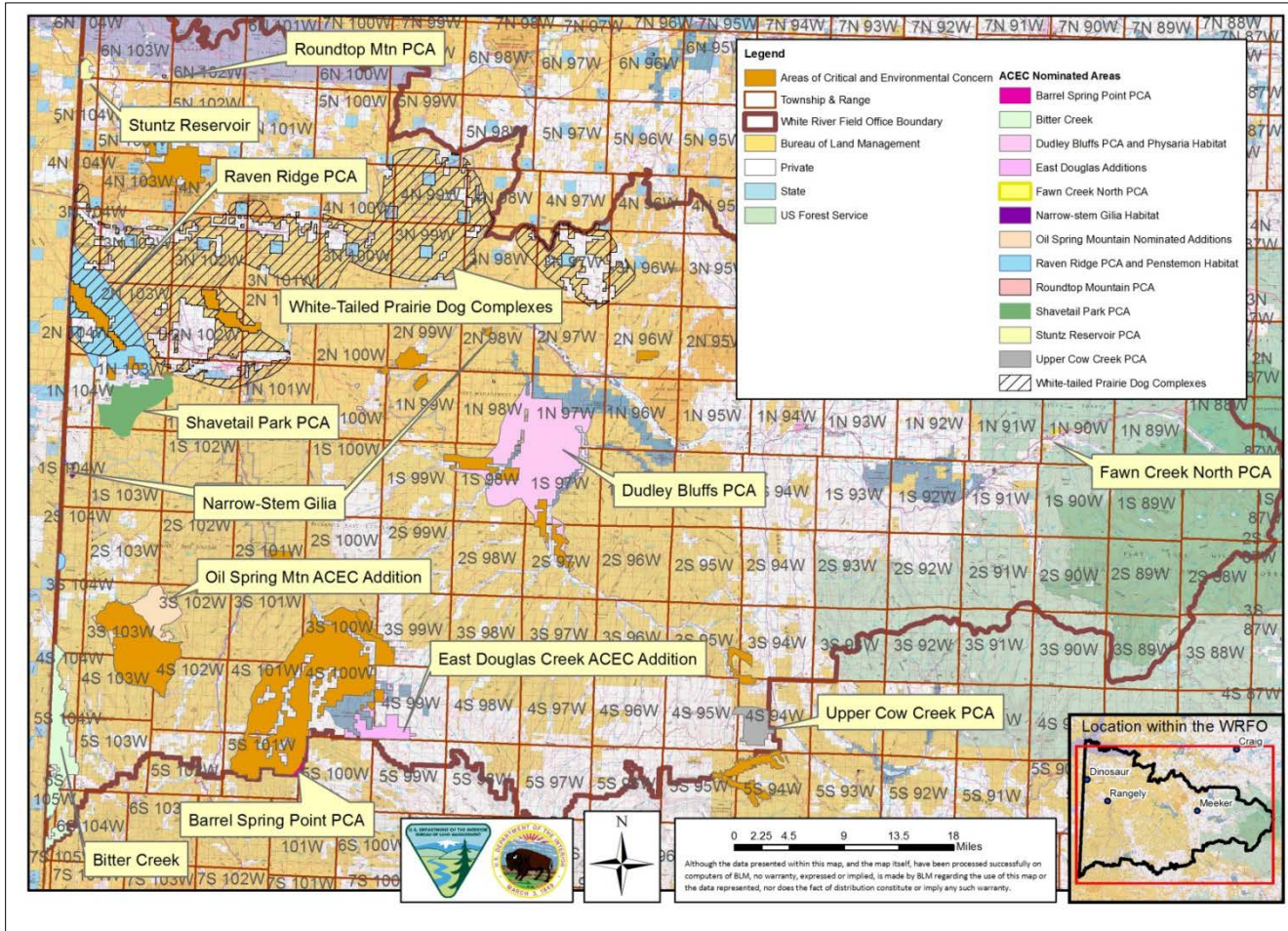


Figure 2. Dudley Bluffs PCA and Physaria Habitat ACEC Nomination

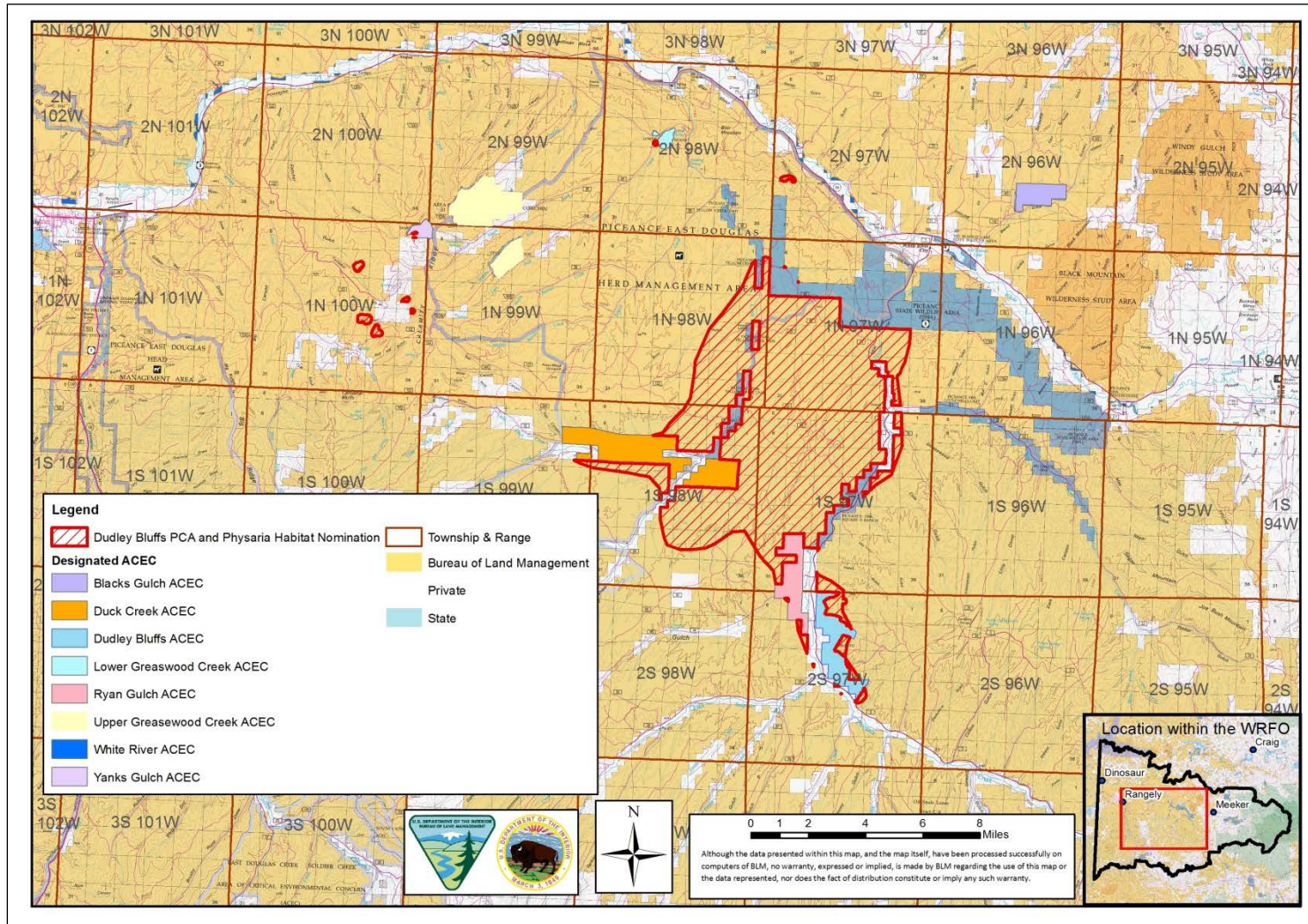


Figure 3. Narrow-stem Gilia Habitat ACEC Nomination

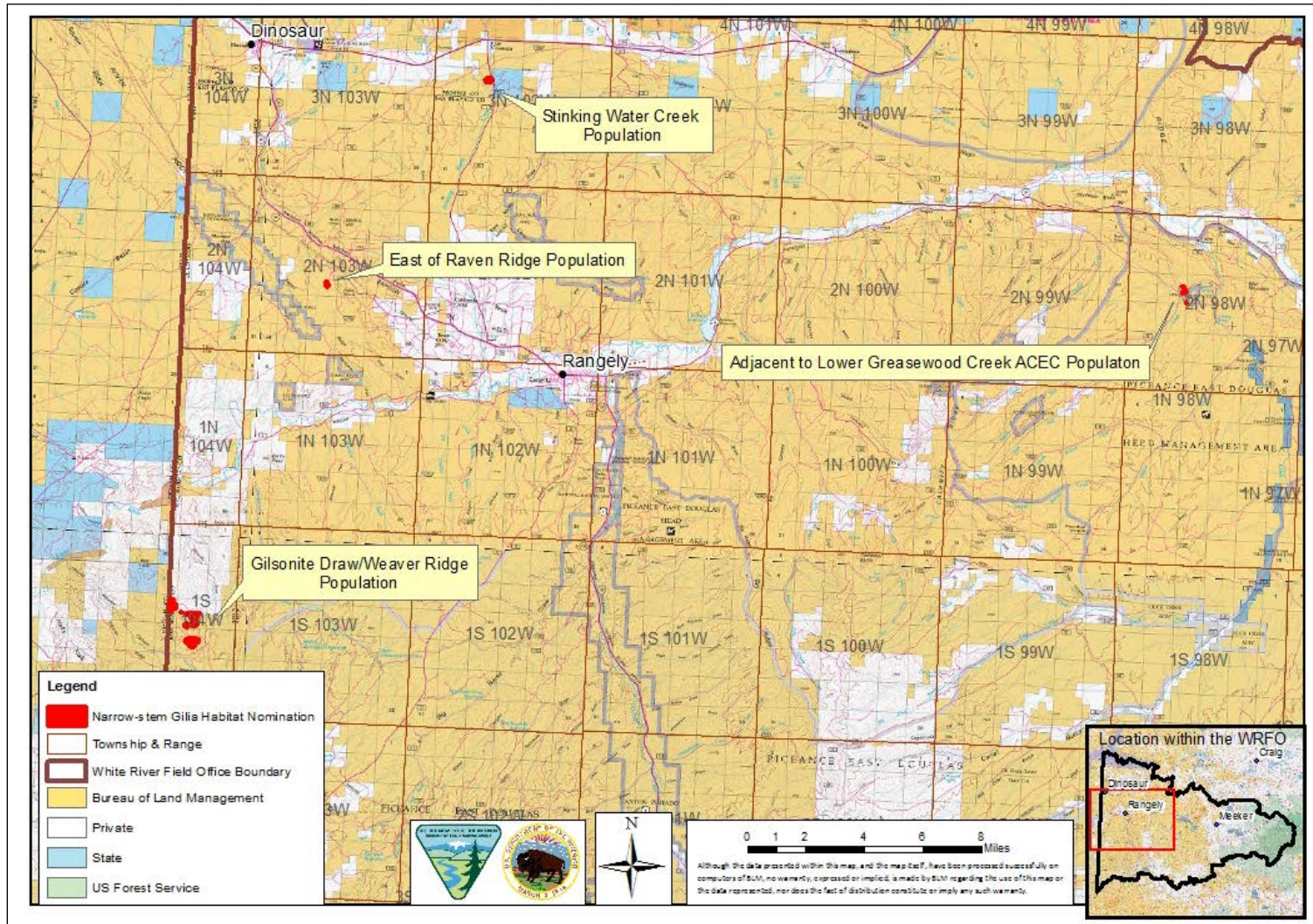


Figure 4. Stuntz Reservoir PCA ACEC Nomination

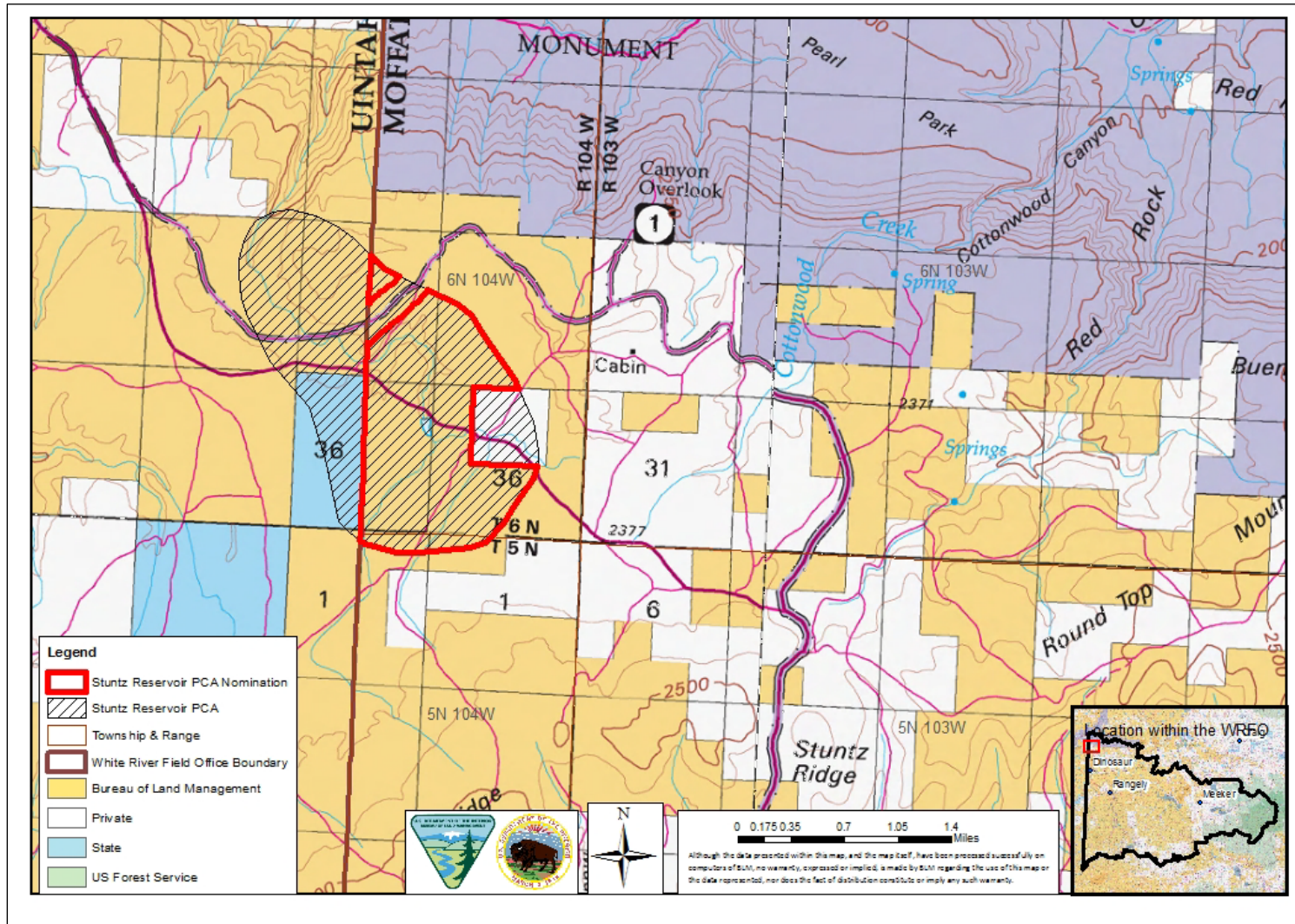


Figure 5. Roundtop Mountain PCA ACEC Nomination

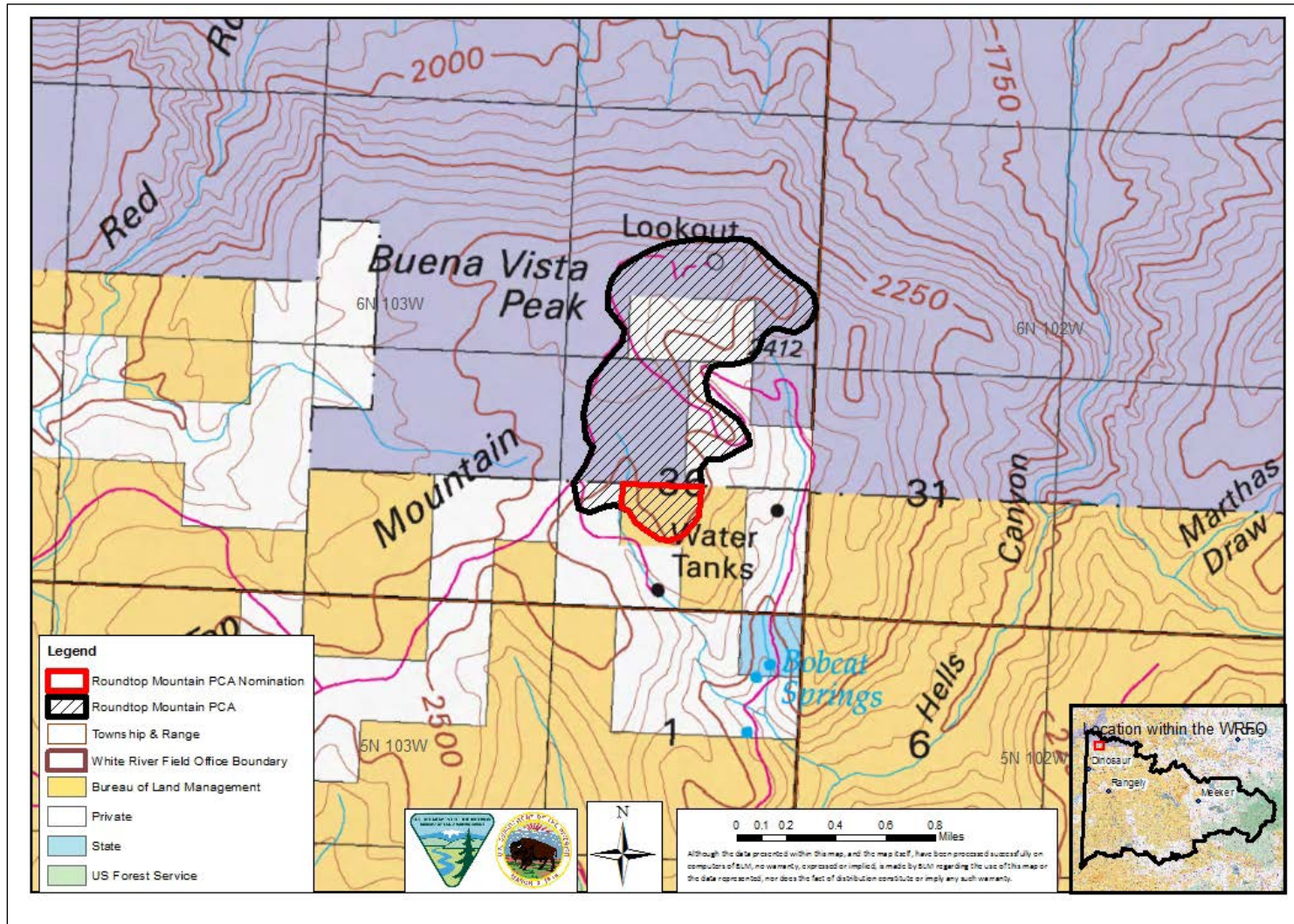


Figure 6. Shavetail Park PCA ACEC Nomination and Raven Ridge PCA and Graham's Penstemon Habitat ACEC Nomination

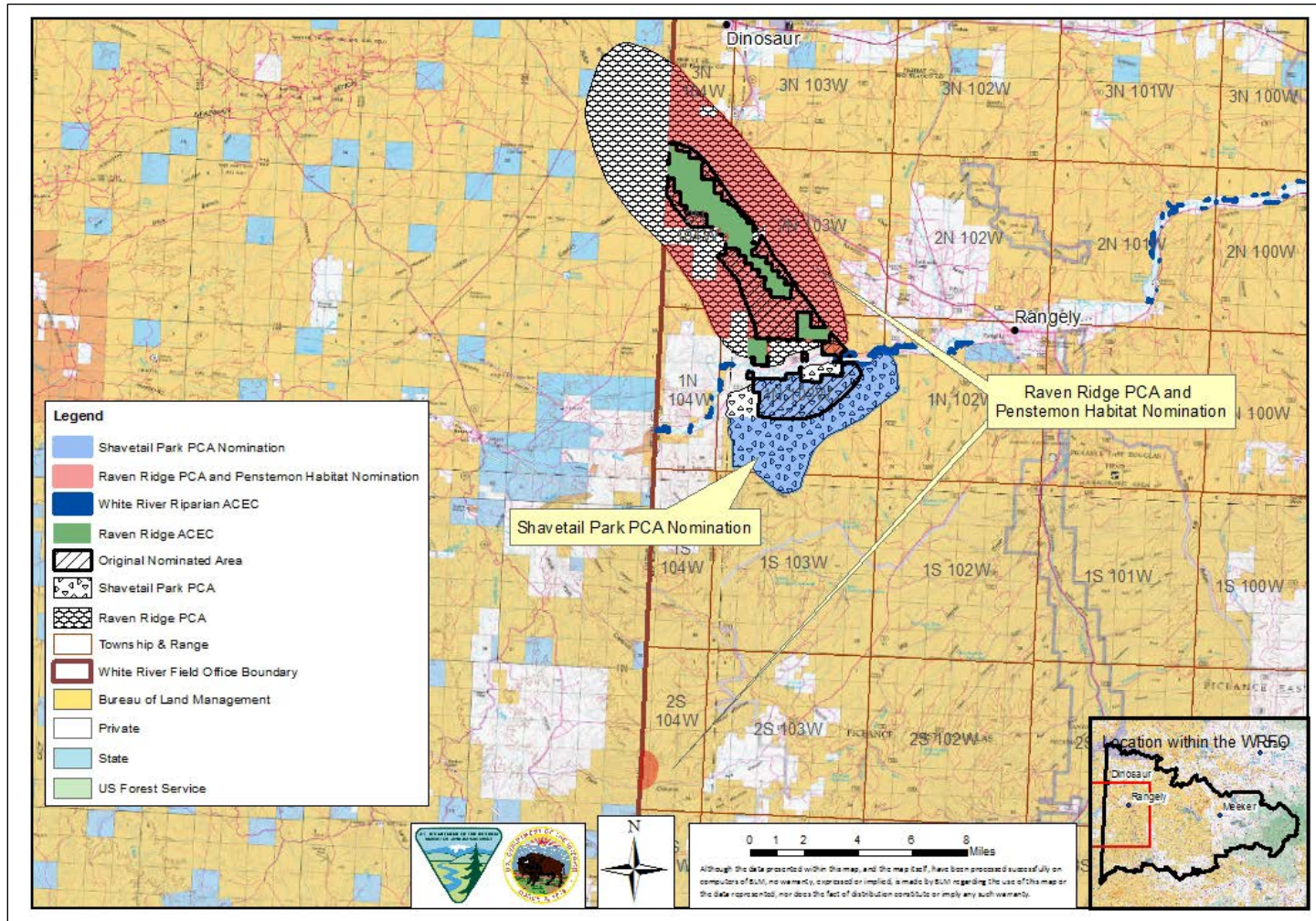


Figure 7. White-tailed Prairie Dog Habitat ACEC Nomination

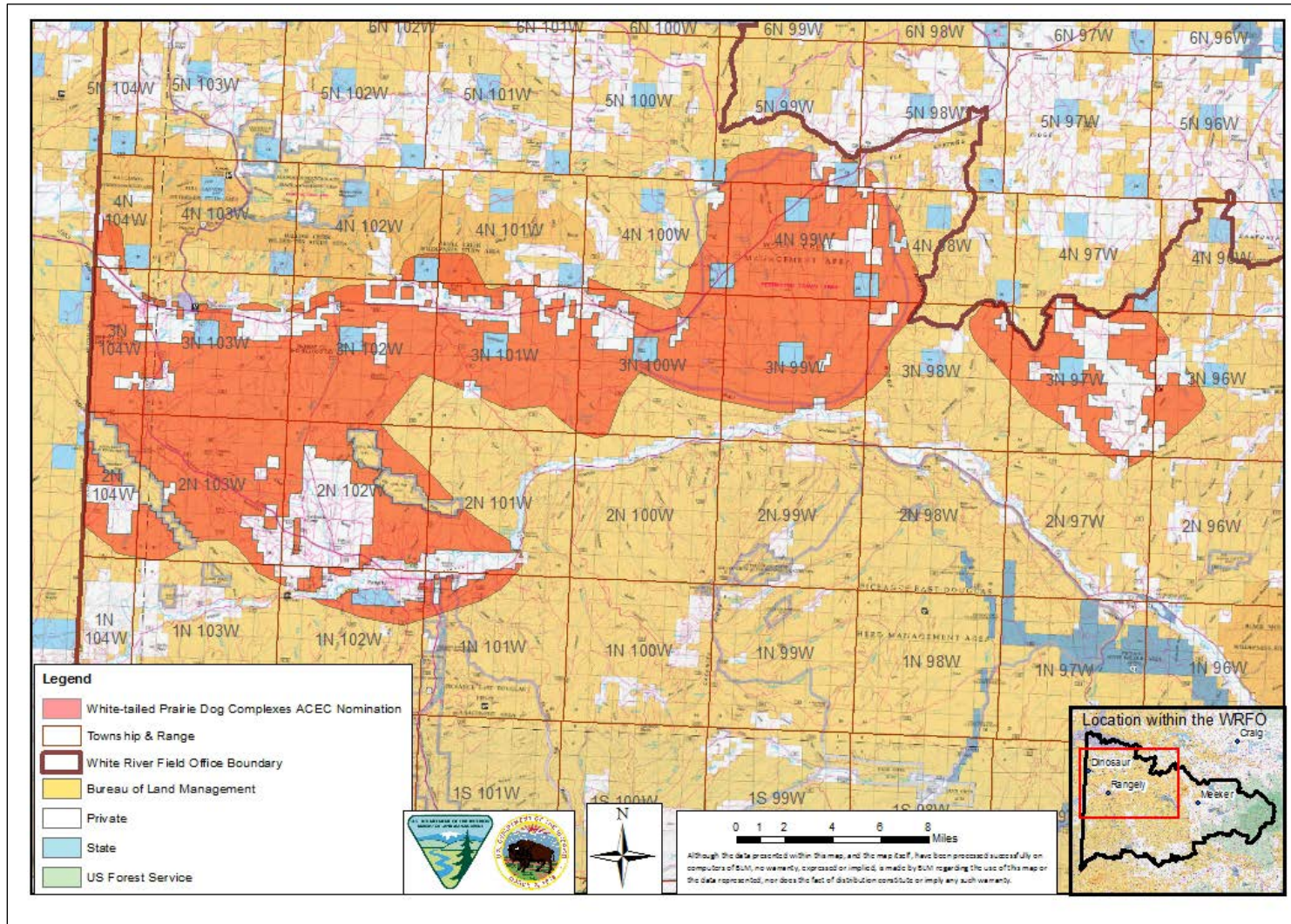


Figure 8. Nominated Additions to the East Douglas ACEC

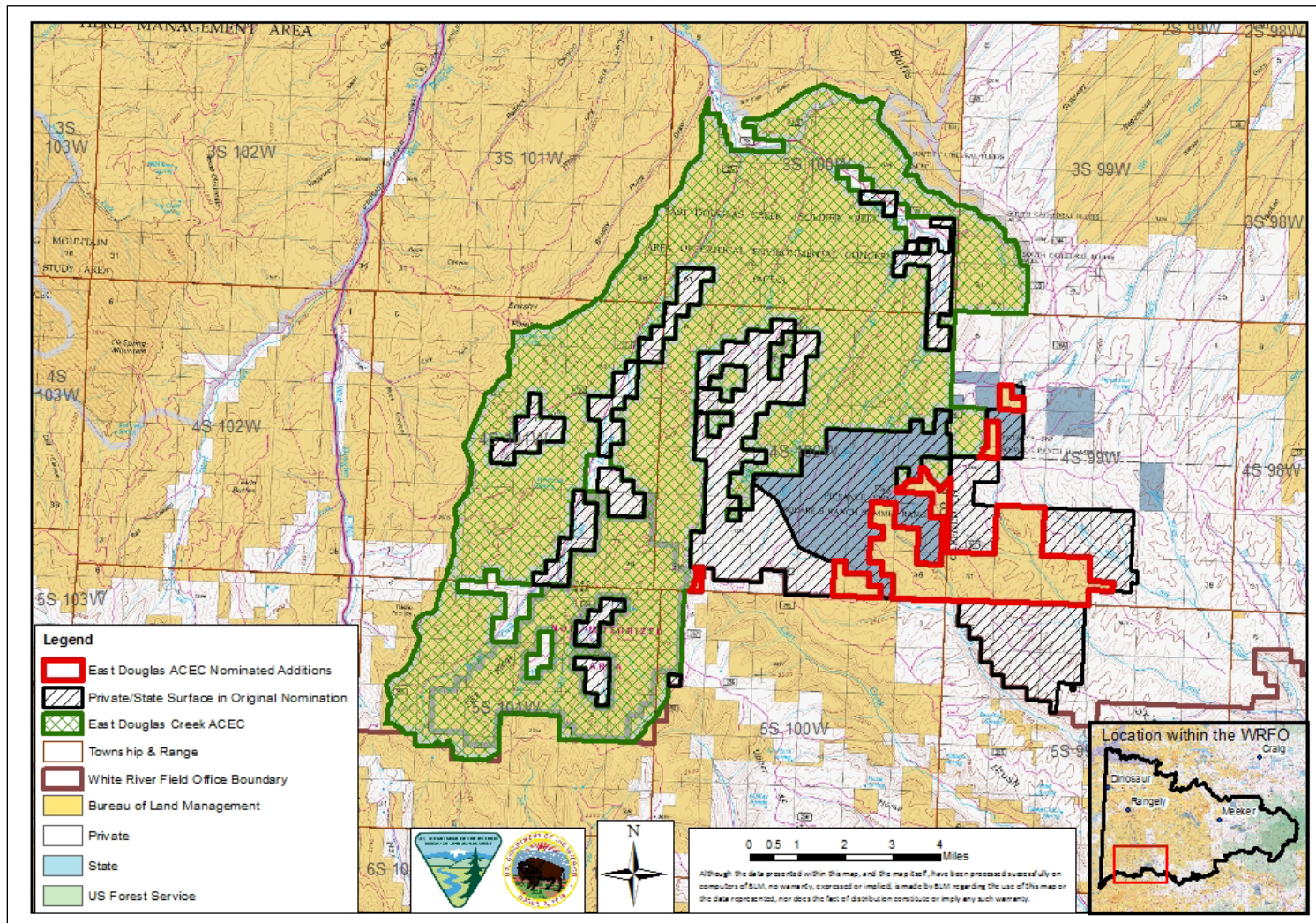


Figure 9. Nominated Addition to the Oil Spring Mountain ACEC

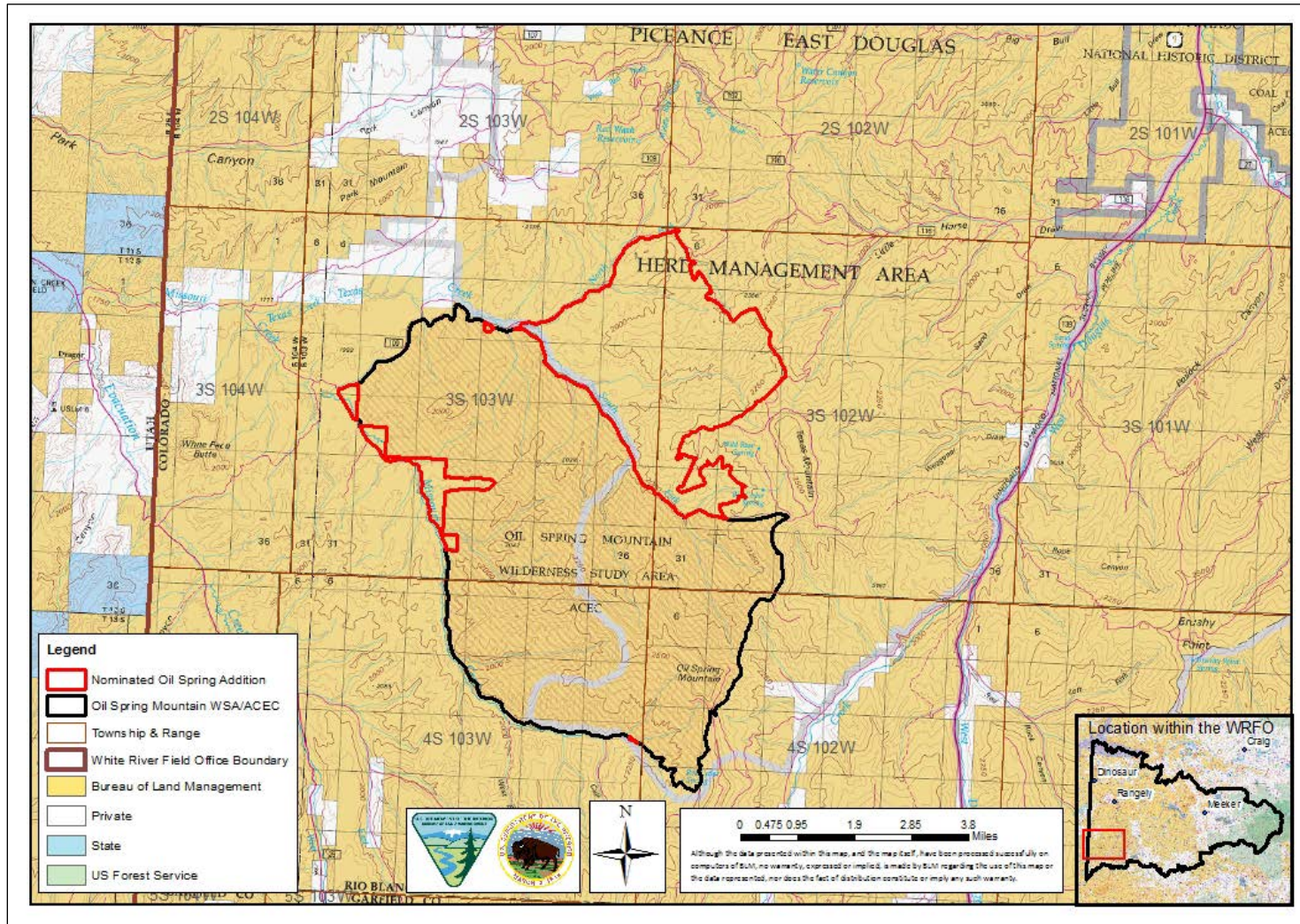


Figure 10. Upper Cow Creek PCA ACEC Nomination

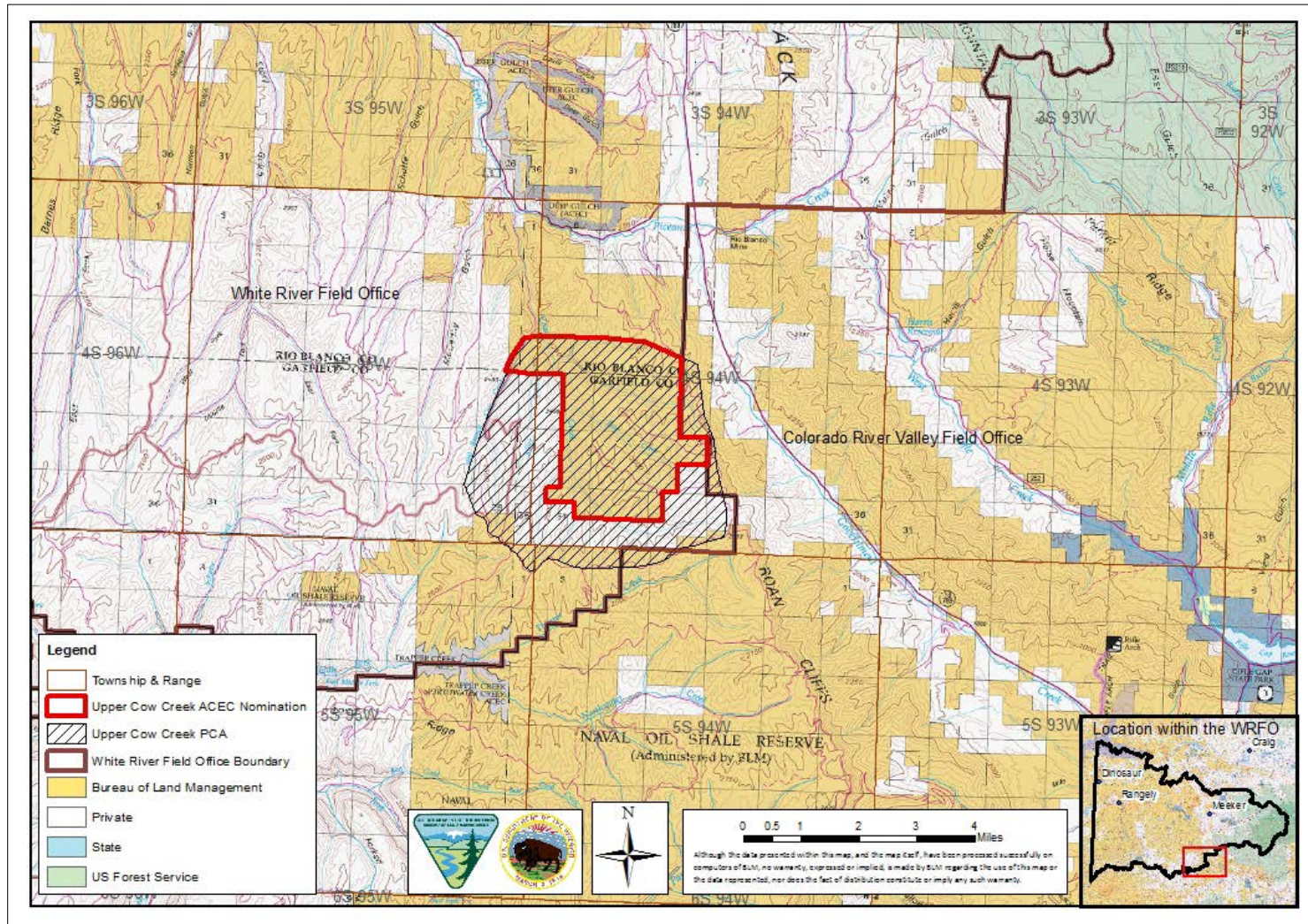


Figure 11. Fawn Creek North PCA ACEC Nomination

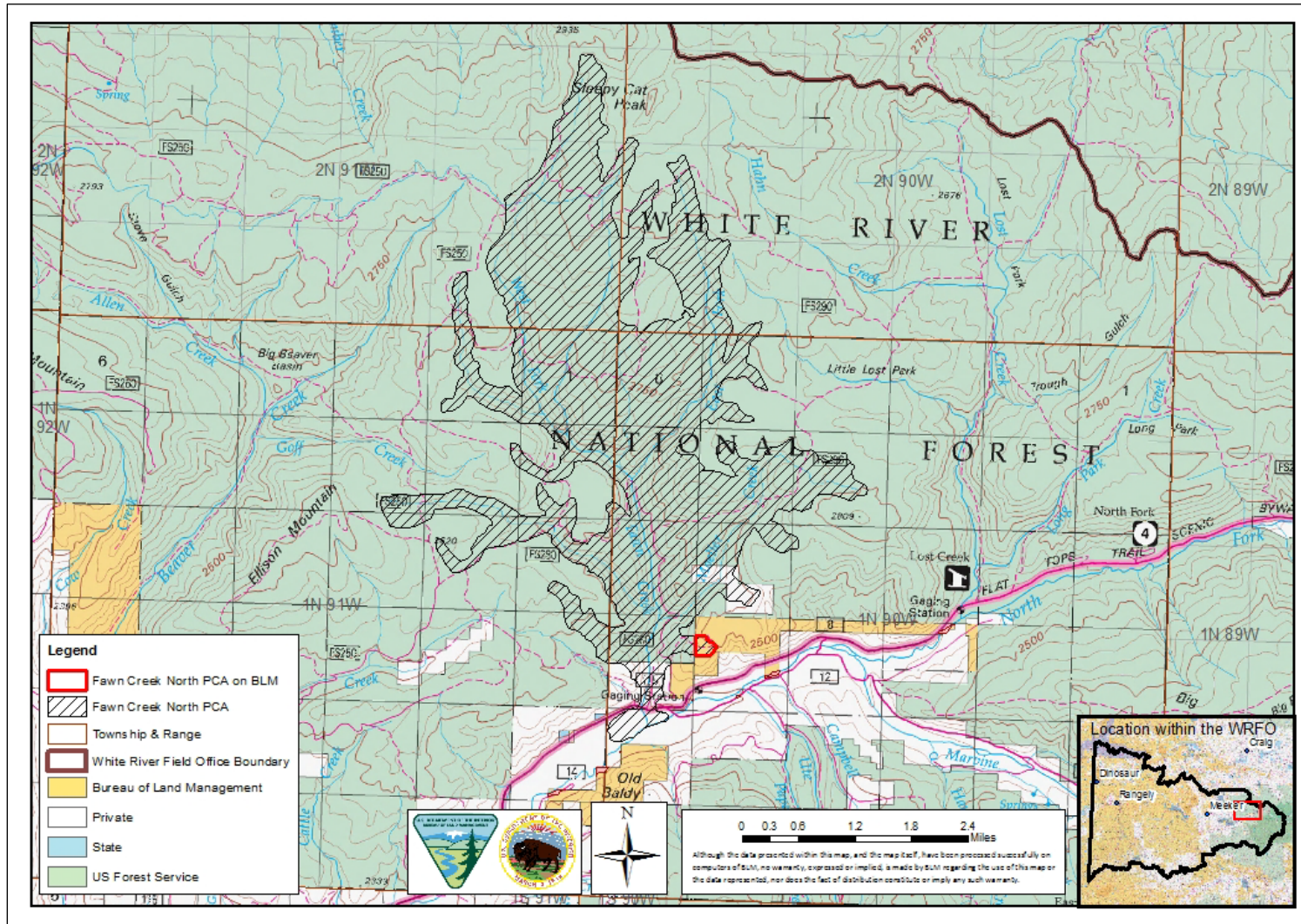


Figure 12. Bitter Creek PCA ACEC Nomination

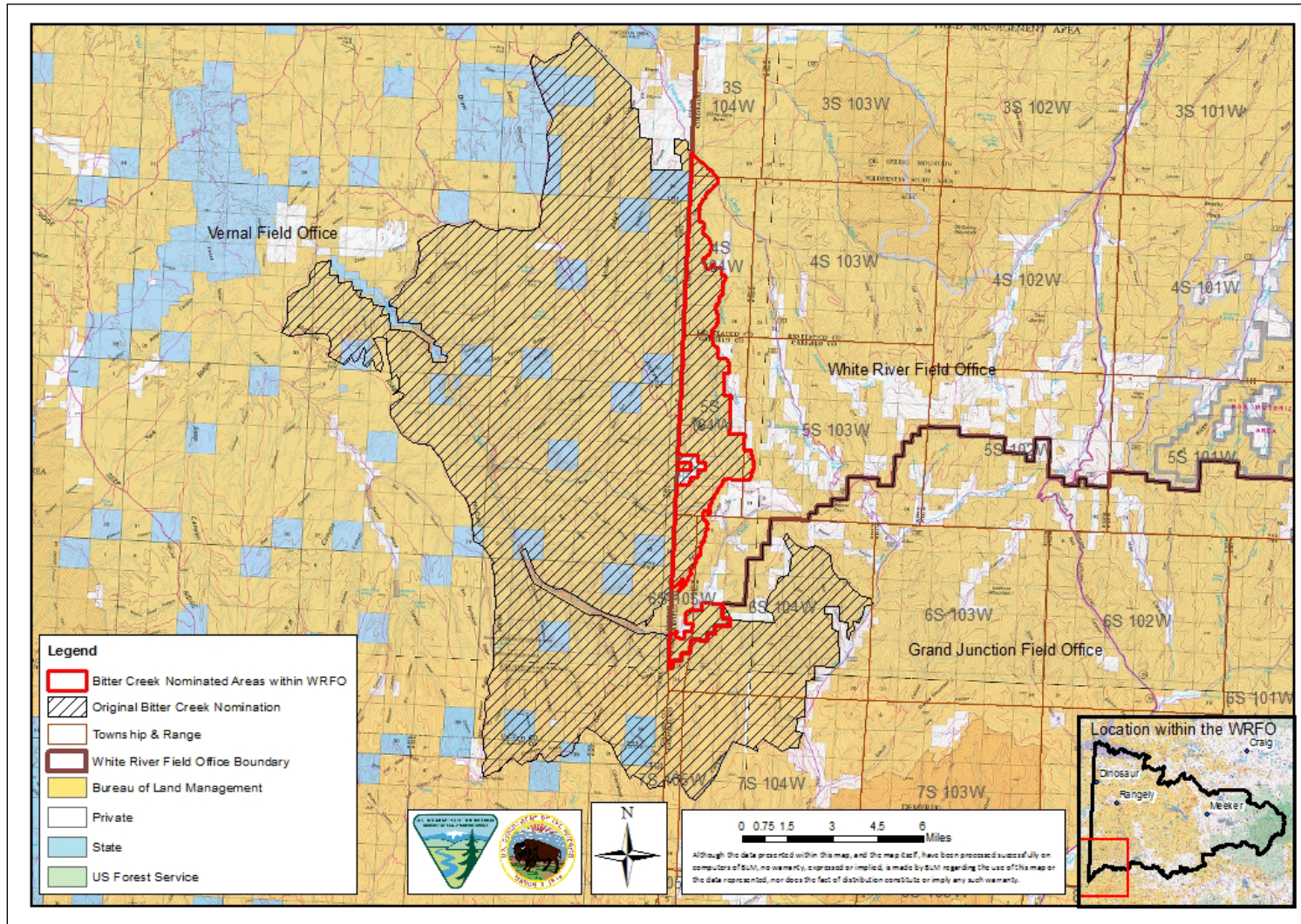


Figure 13. Barrel Spring Point PCA ACEC Nomination

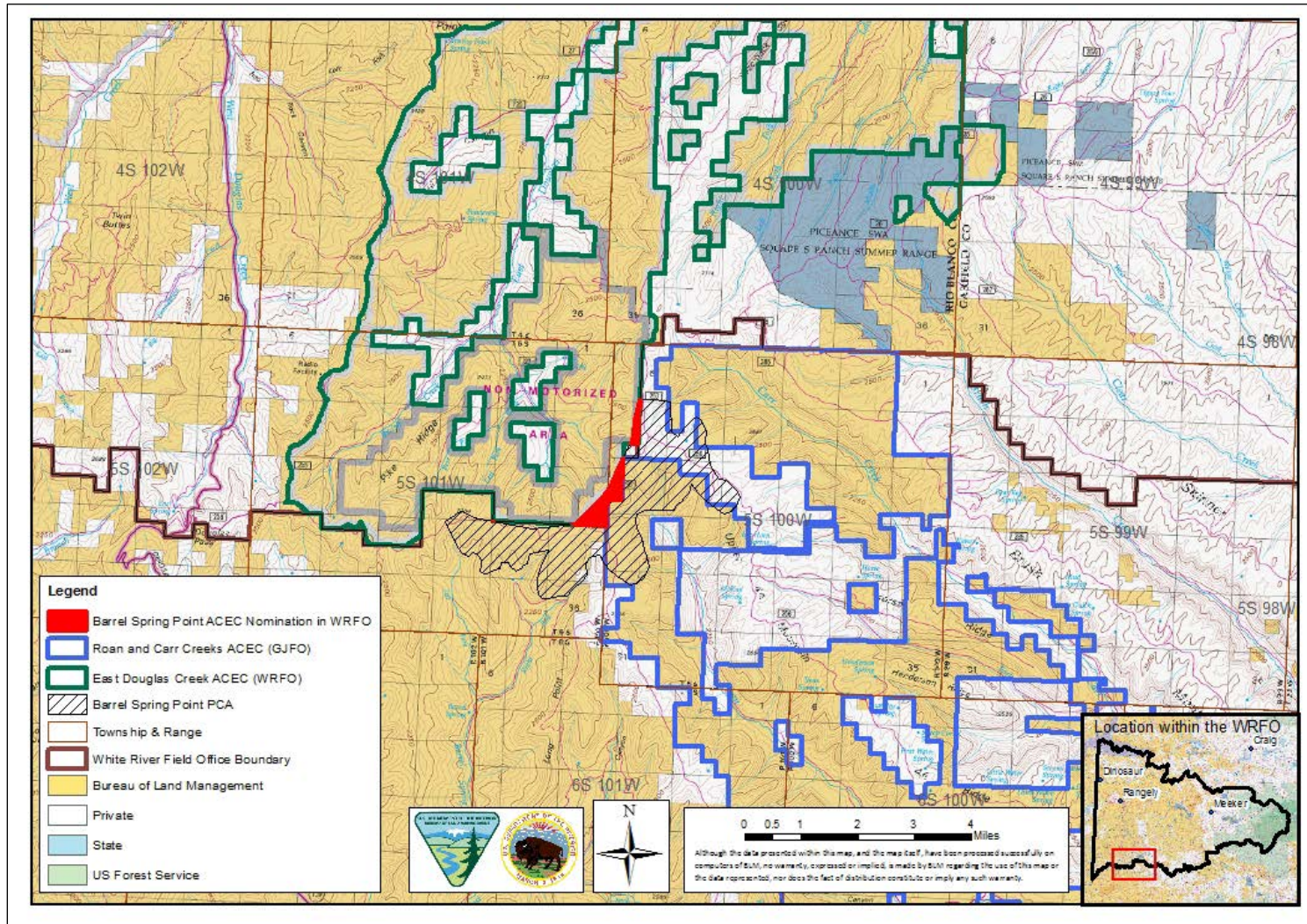
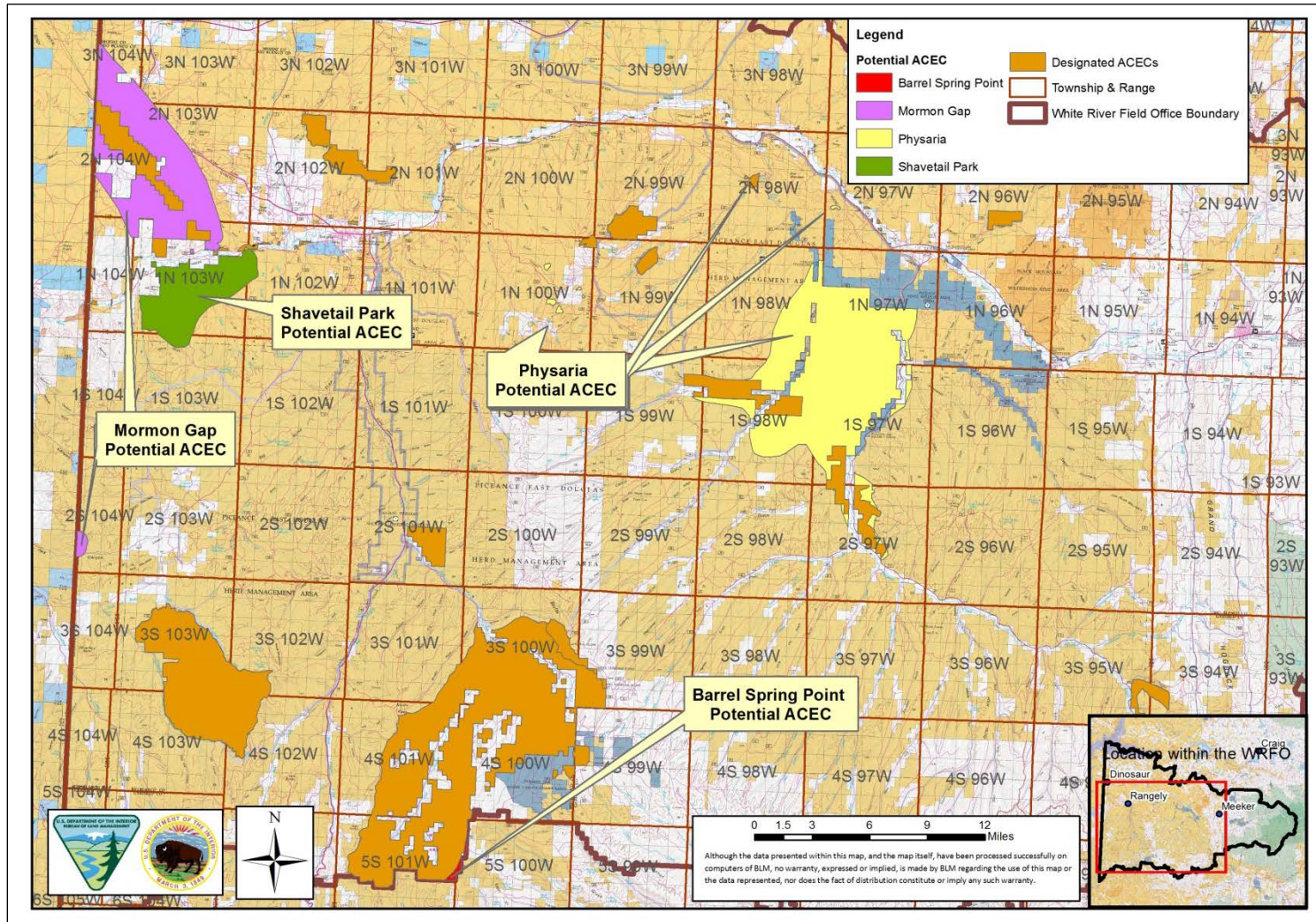


Figure 14. Potential ACECs



APPENDIX B.

BEARDTONGUE CONSERVATION AGREEMENT

Threats to Graham's and White River Beardtongue and Associated Conservation Actions
(Table 4 in the Conservation Agreement)

Threat and Associated Impacts	Conservation Action
Energy Exploration and Development	
Habitat loss/fragmentation	<p>1. Conservation areas totaling 44,373.4 acres will be established by this Agreement (see Maps 1–5 in Appendix A). These conservation areas include 5,886.9 acres on private and state lands that may not be protected if the species were listed under ESA. Development and surface disturbance will be minimized and consolidated to reduce habitat fragmentation, in conservation areas by the following actions:</p> <ul style="list-style-type: none"> • Limiting new surface disturbance to 5% per unit on federal lands and by landowner on non-federal lands for Graham's beardtongue, and 2.5% per unit on federal lands and by landowner on non-federal lands for White River beardtongue • Avoiding plants by 300 feet. Surface disturbing activities may occur within 300 feet of plants if it benefits or reduces impacts to the species or habitat. On non-federal lands surface disturbance within 300 ft of either species will need to be approved by the conservation team. On federal lands if surface disturbance is within 300 ft of either species BLM will first conference with USFWS. • Calculating new surface disturbance from those activities that include a permanent structure, activities that require a permit, or new roads or improvements to existing roads <p>2. Within 1 year of signing the Agreement, the conservation team will develop criteria for the calculation of surface disturbance. The BLM and non-federal partners will conduct an analysis of the amount of existing surface disturbance within conservation areas. The conservation team will examine and modify the surface disturbance limits if needed based on the results of the analysis to allow for flexibility in siting projects and avoiding plants. The results of the disturbance analyses will not reduce new surface disturbance below the limits defined in conservation action 1 above.</p> <p>3. Successful ecological restoration (see Ecological Restoration Section below) may be used in conservation areas on private lands to offset disturbance limits.</p>
Direct mortality from surface disturbance	<p>4. On federal lands, ground-disturbing activities including oil and gas exploration and development will conform with BLM special-status plants species policies, and these species will be treated as a BLM sensitive species. Within designated conservation areas, the BLM will do the following:</p> <ul style="list-style-type: none"> • Limit new surface disturbance to 5% per unit for Graham's beardtongue and 2.5% per unit for White River beardtongue • Survey for plants within 300 feet of proposed disturbance (see Survey and Monitoring requirements in table notes) • Avoid disturbance within 300 feet of plant. Surface disturbing activities may occur within 300 feet of plants if it benefits or reduces impacts to the species or habitat. When this occurs BLM will first conference with USFWS. • Minimize and consolidate development to reduce habitat fragmentation <p>Outside conservation areas on federal lands, ground-disturbing activities will be sited to avoid Graham's and White River beardtongue plants by 300 feet.</p> <p>5. On non-federal lands in a conservation area or interim conservation area, new ground-disturbing activities including oil and gas exploration and development proponents will follow these procedures:</p> <ul style="list-style-type: none"> • Pre-site surveys will be conducted to determine presence and locations of plants (see Survey and Monitoring requirements in table notes) • Surface disturbance will be limited to 5% new surface disturbance for Graham's beardtongue and 2.5% new surface disturbance for White River beardtongue (high-density core population areas on non-federal lands are shown in Maps of Appendix A) • Avoid plants by 300 feet. Surface disturbing activities may occur within 300 feet of plants if it benefits or reduces impacts to the species or habitat and is approved by the conservation team. <p>6. On federal and non-federal lands where new surface disturbance will occur in a conservation area within 300 feet of plants, the project proponent will mitigate for impacts. Within 1 year of signing the Agreement, the conservation team will develop a</p>

Threat and Associated Impacts	Conservation Action
	<p>standardized procedure to address how mitigation is to occur depending on level of impacts. Examples of mitigation could include payments into a mitigation fund for minor impacts, protection of other occupied areas at a ratio specified by the conservation team, or site-specific mitigation appropriate to each project as determined by the conservation team.</p> <p>7. On non-federal land outside conservation areas and interim conservation areas with approved exploration or plan of operations permits, conservation actions are encouraged but voluntary. Good faith, voluntary actions could include avoidance, minimizing impacts to individual plants, seed collection, plant salvage and transplant, and experimental reclamation and restoration treatments.</p>
Indirect disturbance from surface disturbance, including increased dust; introduction and spread of invasive, non-native plant species; and habitat fragmentation	See conservation actions 1–3.
Community and habitat loss and disturbance from surface disturbance, including soil and vegetation removal	See conservation actions 1–3.
Restricted pollinator movement, mortality and disturbance from roads and associated traffic, and energy emissions	See conservation actions 1–3.
Increased sedimentation and erosion	See conservation actions 1–3.
Pollinator scarcity	See conservation actions 1-6
Inadequacy of Existing Regulatory Mechanisms	
Lack of range-wide protection	<p>See conservation actions 1–7.</p> <p>8. The BLM will ensure that ongoing and future federal actions support or do not preclude the species' conservation. All projects in designated conservation areas and their potential to impact the species will be reported in the conservation team's annual report.</p> <p>9. The BLM will retain Graham's and White River beardtongues on the BLM special-status species list as a sensitive species with new ground-disturbing activities avoiding plants by 300 feet (inside and outside conservation areas), and ensure that the effects of proposed projects are analyzed for the species.</p> <p>10. The BLM will consider land exchanges with state and private landowners to expand or otherwise enhance the value of conservation areas on federal lands and facilitate the long-term persistence and recovery of the species, while protecting the long-term economic sustainability of the area.</p> <p>11. The BLM will incorporate the provisions of this Agreement or the latest amendments to this Agreement into its Resource Management Plan planning process, permitting requirements, agency planning documents and budgets. Within 3 months of the signature date of the Agreement, the BLM will incorporate the provisions of this plan into permits and budgets. During the next planning cycle, the BLM will incorporate the provisions of this Agreement into their RMP planning process. The conservation team will provide an annual report on the implementation of this Agreement. The report will also include monitoring results and adaptive management recommendations.</p> <p>12. If federal land within a conservation area is transferred to the State of Utah, the state agrees to maintain the designated conservation areas and protections for the two species in the transferred parcels, or place lands of comparable or greater value to the conservation of the species in conservation areas within the same species unit as approved by the conservation team.</p> <p>13. Utah County will enact an ordinance with associated enforcement protocols and penalties that adopts the conservation measures in this Agreement, including limiting new surface disturbance in conservation areas to 5% for Graham's and 2.5% for White River beardtongue and avoiding impacts to plants by 300 feet in designated conservation areas on non-federal and non-state lands, within 3 months after the signing of this Agreement.</p> <p>14. SITLA will enact a regulation, order, or lease stipulation, as applicable, within 3</p>

Threat and Associated Impacts	Conservation Action
	<p>months of signing this Agreement that will limit new surface disturbance to 5% for Graham's and 2.5% for White River beardtongue, and avoid impacts to plants by 300 feet in designated conservation areas or interim conservation areas on SITLA lands.</p> <p>15. The conservation team will develop and implement a scientifically valid monitoring plan (approved by consensus) to determine trends in plant populations across the range of the species. The plan should include continued monitoring at the current sites established by Red Butte Gardens, and establish additional monitoring sites to capture range-wide variation in habitat, climate, and population processes.</p> <p>16. The conservation team will coordinate annual seed collections in all areas where the species are present (with landowner approval), in accordance with USFWS and Center for Plant Conservation (CPC) guidelines, for placement in storage at Red Butte Garden and the National Center for Genetic Resources Preservation. A seed collection plan will be developed and implemented with approval from the USFWS.</p>
Loss of plants/habitat under federal landownership/management	See conservation actions 8–11 and 15–16.
Loss of plants/habitat under non-federal landownership/management	<p>In conservation areas on non-federal lands, conservation actions 5–7 and 12–16 would minimize and mitigate any loss of individual plants and habitat.</p> <p>17. On SITLA interim areas (Class A: 1,686.6 acres, Class B: 1,327.4 acres) and private interim areas (345.5 acres) prior to approval of any exploration or plan of operations, these areas will also have a limit of 5% new disturbance for Graham's and 2.5% for White River beardtongue as set forth in conservation action 14. In the event there are surface-mine plan filings that would necessitate the destruction or removal of habitat, SITLA or the landowner, upon election to convert all or part of an interim conservation area to a non-conservation area, will require pre-disturbance surveys, and to the extent feasible in its reasonable judgment, after consultation with the conservation team, salvage a minimum of 50 plants or 25% of the total population size, whichever is greater, and collect seed from 50 plants or 25% of the total population size for long-term conservation at Red Butte Garden of identifiable plants from the disturbance area. To the extent feasible, pre-disturbance surveys should be initiated a minimum of 1 year prior to surface-disturbing activities. To the extent feasible, plants should be salvaged in late fall to maximize survival and likelihood of transplant success. Transplant and monitoring of salvaged plants will be overseen by the conservation team.</p> <p>18. On private lands, conservation actions on occupied habitats outside of designated conservation areas will be entirely voluntary. Plant and seed salvage and other good faith efforts to protect plants and restore habitat will be considered, but will not be mandatory. The conservation team is expected to work with private entities to promote and provide support for conservation actions on private lands, and will consider creation of a conservation credit system for plant salvage, habitat banking, support of conservation initiatives, and other voluntary activities that promote the persistence and recovery of the species. The conservation team should also promote voluntarily restoration and habitat banking or exchanges by private landowners, where landowners would restore occupied habitat or dispersal corridors in anticipation of the need for future revisions of conservation areas on their property or by other private landowners. Allocation or allowances for landowner credits for conservation banks or exchanges would be subject to the authority of the conservation team. The conservation team would also determine how restored populations and habitats would be utilized.</p>
Habitat loss and fragmentation	See conservation actions 1–3.
Livestock Grazing on BLM-Managed Lands	
Herbivory of all or part of aboveground portion of vegetative portion of plant	<p>19. On federal lands where the species co-occur with livestock grazing during the growing season (April through September), the BLM will develop and implement a mitigation and monitoring plan for each allotment within 1 year of signing this Agreement. If monitoring identifies that livestock grazing is negatively affecting the species, the BLM will immediately adjust livestock management in the allotment to ameliorate those impacts. Short-term adjustments may include construction of temporary drift fences to keep livestock away from occupied habitat, and long-term adjustments may include permanent fencing or modifying the grazing schedule. In any adjustment made to allotments, the authorized officer will include consultation, cooperation and coordination with affected permittees, as stipulated in 43 CFR 4130.3-3. The conservation team will be consulted as necessary. The conservation team will be apprised of changes and modifications to</p>

Threat and Associated Impacts	Conservation Action
	management of allotments through annual reporting to the conservation team.
Herbivory of all or part of the inflorescence	See conservation action 19.
Trampling of plant and habitat	See conservation action 19.
Change in community composition	See conservation action 19.
Invasive species invasion, spread, and competition	See conservation actions 19 and 20–24.
Alteration of soil characteristics	See conservation action 19.
Road Construction and Maintenance	
Direct mortality from surface disturbance	See conservation actions 1–3.
Invasive species invasion, spread, and competition	See conservation actions 20–24.
Increased dust emissions	See conservation actions 1–3.
Restricted pollinator movement from roads	See conservation actions 1–3.
Habitat loss/fragmentation	See conservation actions 1–3.
Invasive Weeds	
Invasion and establishment of non-native plants	<p>20. Within 1 year of signing the Agreement, the conservation team will develop, fund, and implement a weed management plan (approved by consensus) in conservation areas that includes repeated annual targeted surveys to detect invasions and treatment of invasive species as soon as detected. This plan can be incorporated as part of a range-wide monitoring plan.</p> <p>21. The weed management plan will identify treatment options for each known invasive species in the habitat of the species, with the goal of selecting the most appropriate option that controls weeds and minimizes adverse effects to Graham's or White River beardtongues and their native plant community.</p> <p>22. The conservation team will develop and implement a monitoring protocol in the weed management plan to determine the effectiveness of their actions.</p> <p>23. The conservation team will review and update the weed management plan annually based on surveys, monitoring, and other information sources, and create an annual schedule of work targeting priority areas.</p> <p>24. The weed management plan will develop and adopt best management practices for preventing the spread of invasive and/or exotic plants in the designated conservation areas on federal and non-federal lands.</p>
Competition	See conservation actions 20–24.
Community alteration	See conservation actions 20–24.
Small Population Size	
Stochastic events	<p>See conservation actions 1–7 and 15–16.</p> <p>25. Historical locations of <i>Penstemon scariosus</i> var. <i>albifluvis</i> near the western end the species' range should be revisited for collection of new voucher specimens and samples for genetic testing. The conservation team will plan and implement a distribution/genetics study to determine overlap and/or division between <i>Penstemon scariosus</i> var. <i>garettii</i> and <i>Penstemon scariosus</i> var. <i>albifluvis</i> geographic ranges as part of this Agreement.</p>
Inbreeding depression	See conservation actions 1–7, 15–16, and 25.
Lower sexual reproduction	See conservation actions 1–7, 15–16, and 25.
Loss of genetic diversity	See conservation actions 1–7, 15–16, and 25.

Threat and Associated Impacts	Conservation Action
Climate Change	
Mortality caused by drought	26. As part of demographic monitoring of the species, a component will be included to study the relationship between precipitation patterns and species' growth, reproduction and recruitment, and mortality. This may be accomplished by establishing weather-monitoring equipment at existing long-term demographic sites currently monitored by Red Butte Garden.
Stress, lack of reproduction and recruitment, and mortality caused by shifting rainfall patterns	See conservation action 26.
Habitat degradation	See conservation actions 1–3.
Wildfire	
Mortality	27. Any wildfire planning, suppression activities, and post-wildfire actions on federal and non-federal lands in occupied habitat will include mitigation consistent with the Agreement and include pre-season input from the conservation team.
Community composition alteration	See conservation actions 20–24 and 27.
Post-fire response ground disturbance	See conservation action 27.
Increased invasion and competition from invasive species	See conservation actions 20–24 and 27.
Off-Road Vehicles	
Direct mortality	28. On federal lands, traffic will be limited to designated routes, and routes will be considered for closure, limited use, or re-routing as appropriate to gain compliance and protect designated conservation areas. This will not include any routes claimed by Uintah County as public roads. 29. On non-federal lands where off-highway vehicle (OHV) use occurs, wherever possible, landowners and managers will attempt to re-route OHV use away from designated conservation areas and keep traffic on existing roads and trails.
Increased dust load	See conservation actions 1–3.
Fragmentation of habitat	See conservation actions 1–3.

Note: Survey/Monitoring/Best Management Practices:

Prior to any surface disturbance in federal and non-federal conservation areas, surveys will be conducted within the area of disturbance and out to 300 feet from the edge of the disturbance to determine species presence, population, and distribution. Surveys will follow standard survey protocol as detailed in the USFWS *Utah Field Office Guidelines for Conducting and Reporting Botanical Inventories and Monitoring of Federally Listed, Proposed and Candidate Plants* (2011).

On all federal and non-federal lands, the landowner/manager will collect seeds and/or salvage a portion of plants from areas to be disturbed to ensure genetic representation of the species. Seeds can be used for restoration but at least a portion of these seeds should be given to Red Butte and Denver Botanic Gardens for long-term storage.

From: Boyd, David
To: [David Boyd](#)
Subject: News Release: BLM evaluating oil and gas leasing proposals for Grand, Jackson, Moffat, Rio Blanco and Routt counties
Date: Monday, August 8, 2016 1:06:51 PM
Attachments: [May 17 lease EA scoping nr 8-8-16.pdf](#)

News Release

White River Field Office, Colorado

Aug. 8, 2016

Contact: David Boyd, Public Affairs Specialist, (970) 876-9008

BLM evaluating oil and gas leasing proposals for Grand, Jackson, Moffat, Rio Blanco and Routt counties

MEEKER, Colo. – The Bureau of Land Management is seeking public comments on a proposal to offer about 100,000 acres of federal minerals in northwestern Colorado in the May 2017 competitive oil and gas lease sale.

Before beginning an environmental assessment on the proposal, the BLM wants to hear from the public about any issues and concerns they feel should be considered as it evaluates leasing these parcels. The EA itself will be released for public review and comment in November.

“The most effective comments will address issues and concerns specific to these parcels being considered,” said BLM Northwest Colorado District Manager Joe Meyer.

Maps and lease stipulations are available for review at <http://on.doi.gov/2b39pWq>.

The proposal includes 20 parcels totaling 27,529 acres in Grand County; 12 parcels totaling 9,155 acres in Jackson County; four parcels totaling 1,928 acres in Moffat County; 45 parcels totaling 45,331 acres in Rio Blanco County; and 25 parcels totaling 17,085 acres in Routt County. The BLM lands in this lease sale conform to the 2015 Northwest Colorado Greater Sage-Grouse RMP Amendment.

Comments during this first public comment period need to be received by Sept. 7, 2016. They should be e-mailed to blm_co_may_2017_lease_sale@blm.gov, or mailed to the White River Field Office, Attn: May 2017 Lease Sale, 220 E. Market St., Meeker, CO 81641.

The State of Colorado receives 49 percent of the proceeds from each mineral lease sale and from mineral royalties, with the remainder going to the U.S. government. In Fiscal Year 2015, Colorado received about \$247 million from royalties, rentals and bonus bid payments for all federal minerals, including oil and gas. Statewide, more than 22,900 jobs are tied to mineral and energy development on public lands.

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

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David Boyd

Bureau of Land Management

Public Affairs Specialist

NW Colorado District

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U.S. Department of the Interior
Bureau of Land Management

News Release

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Aug. 8, 2016

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###

From: Kyle Tisdel
To: BLM_UT_Vernal_Comments@blm.gov
Cc: [Jeremy Nichols](#); [Tim Ream](#); [Steve Bloch](#); [Wendy Park](#); [Michael Saul](#); ["Elly Benson"](#); unps@unps.org; [Laura King](#)
Subject: Monument Butte FEIS, Conservation Group Comments
Date: Monday, August 8, 2016 5:10:13 PM
Attachments: [Monument Butte FEIS final.pdf](#)

Ms. Howard,

Please find the attached comments from Western Environmental Law Center, along with WildEarth Guardians, Southern Utah Wilderness Alliance, Center for Biological Diversity, Sierra Club, and Utah Native Plants Society, regarding the final environmental impact statement for the Monument Butte MDP, UT-G010-2009-0217. We will also be sending a disc containing referenced exhibits via certified mail. Should you have any questions please do not hesitate to ask.

Regards.

Kyle J. Tisdel
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Western Environmental Law Center

Comments submitted via electronic mail, Exhibits submitted via certified mail.

August 8, 2016

Bureau of Land Management
Attn: Stephanie Howard
Vernal Field Office
170 South 500 East
Vernal, Utah 84078
Email: [BLM UT Vernal Comments@blm.gov](mailto:BLM_UT_Vernal_Comments@blm.gov)

**RE: Conservation Group Comments Regarding the Monument Butte Area Oil & Gas Development Project and Final Environmental Impact Statement
UT-G010-2009-0217**

Dear Ms. Howard,

The Western Environmental Law Center, along with WildEarth Guardians, Southern Utah Wilderness Alliance, Center for Biological Diversity, Sierra Club, and Utah Native Plants Society (“Conservation Groups”), submit the following comments on the Bureau of Land Management (“BLM”) Monument Butte Area Oil & Gas Development Project and associated Final Environmental Impact Statement (“FEIS”), concerning a 119,743-acre planning area and proposing the approval of 5,750 oil and gas wells and associated infrastructure in BLM’s Vernal Field Office (“VFO”).

Given the critical and fundamental role that impacts from this proposed development would have to the region’s air quality, and, more broadly, on climate change, we appreciate the opportunity to participate and comment on this EIS, as well as BLM’s commitment to integrate the following concerns into its NEPA analysis. *See* 43 C.F.R. § 1610.2; 42 U.S.C. § 4332.

The **Western Environmental Law Center** (“WELC”) uses the power of the law to defend and protect the American West’s treasured landscapes, iconic wildlife and rural communities. WELC combines legal skills with sound conservation biology and environmental science to address major environmental issues in the West in the most strategic and effective manner. WELC works at the national, regional, state, and local levels; and in all three branches of government. WELC integrates national policies and regional perspective with the local knowledge of our 100+ partner groups to implement smart and appropriate place-based actions.

WildEarth Guardians protects and restores wild places, wildlife, and wild rivers in the American West. Through its Climate and Energy Program, Guardians works to sustain a transition from fossil fuels to clean energy in order to safeguard the American West.

Southern Utah Wilderness Alliance (“SUWA”) is a Utah non-profit corporation dedicated to the sensible management of all public lands within the State of Utah, including the preservation and extension of wilderness and wild values such as clean air and water. SUWA’s members have an interest in the air, water, wilderness, wildlife, recreational, scenic, and other natural and cultural resources that are managed by BLM in Utah. SUWA members and staff use and enjoy the lands affected by the proposed Monument Butte project for photography, birdwatching, recreation, and other activities. SUWA has a well-known and longstanding interest in the Uinta Basin and the greater Green River area and has participated in the public comment period on numerous development proposals within this area.

The **Center for Biological Diversity** (“the Center”) is a nonprofit environmental organization dedicated to the protection of imperiled species and their habitats through science, education, policy, and environmental law. The Center has over 1.1 million members, supporters and activists dedicated to the conservation of endangered species and wild places, protection of human health and welfare, and combating climate change.

The **Sierra Club** is a national nonprofit organization with 64 chapters and over 635,000 members dedicated to exploring, enjoying, and protecting the wild places of the earth; to practicing and promoting the responsible use of the earth’s ecosystems and resources; to educating and enlisting humanity to protect and restore the quality of the natural and human environment; and to using all lawful means to carry out these objectives. The Utah Chapter of the Sierra Club has more than 4,000 members in the state of Utah, including members who live or recreate in areas that would be affected by this oil and gas development project. Sierra Club members use the public lands in Utah, including the lands and waters that would be affected by actions under the project, for quiet recreation, scientific research, aesthetic pursuits, and spiritual renewal. These areas would be threatened by increased oil and gas development that could result from the proposed project.

Utah Native Plant Society (“UNPS”) joins these comments for purpose of the issues raised herein regarding sensitive plant species. UNPS is a Utah non-profit corporation and qualified IRS 501(c)(3) organization originally incorporated in 1978 and has eight local chapters around the state, and has about 400 members. We are dedicated to the appreciation, preservation, conservation and responsible use of the native plant and plant communities found in the state of Utah and the Intermountain West. Utah Native Plant Society’s support for the following comments is limited to comments relating to native plant species.

Conservation Groups hereby incorporate by reference our prior submitted comments and attached exhibits to the Draft Environmental Impact Statement for the Monument Butte Area Oil & Gas Development Project, dated March 5, 2014.

I. THE VERNAL FIELD OFFICE HAS FAILED TO TAKE A HARD LOOK AT THE DIRECT, INDIRECT AND CUMULATIVE IMPACTS OF OIL AND GAS DEVELOPMENT ON CERTAIN RESOURCE VALUES IN THE PLANNING AREA.

The National Environmental Policy Act (“NEPA”), 42 U.S.C. § 4321 *et seq.*, and its implementing regulations, promulgated by the Council on Environmental Quality (“CEQ”), 40 C.F.R. §§ 1500.1 *et seq.*, is our “basic national charter for the protection of the environment.” 40 C.F.R. § 1500.1. Recognizing that “each person should enjoy a healthful environment,” NEPA ensures that the federal government uses all practicable means to “assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings,” and to “attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences,” among other policies. 43 U.S.C. § 4331(b).

NEPA regulations explain, in 40 C.F.R. §1500.1(c), that:

Ultimately, of course, it is not better documents but better decisions that count. NEPA’s purpose is not to generate paperwork – even excellent paperwork – but to foster excellent action. The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment.

Thus, while “NEPA itself does not mandate particular results, but simply prescribes the necessary process,” *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989), agency adherence to NEPA’s action-forcing statutory and regulatory mandates helps federal agencies ensure that they are adhering to NEPA’s noble purpose and policies. *See* 42 U.S.C. §§ 4321, 4331.

NEPA imposes “action forcing procedures ... requir[ing] that agencies take a *hard look* at environmental consequences.” *Methow Valley*, 490 U.S. at 350 (citations omitted) (emphasis added). These “environmental consequences” may be direct, indirect, or cumulative. 40 C.F.R. §§ 1502.16, 1508.7, 1508.8. A cumulative impact – particularly important here – is defined:

the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

40 C.F.R. § 1508.7.

Federal agencies determine whether direct, indirect, or cumulative impacts are significant by accounting for both the “context” and “intensity” of those impacts. 40 C.F.R. § 1508.27. Context “means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality” and “varies with the setting of the proposed action.” 40 C.F.R. § 1508.27(a). Intensity “refers to

the severity of the impact” and is evaluated according to several additional elements, including, for example: unique characteristics of the geographic area such as ecologically critical areas; the degree to which the effects are likely to be highly controversial; the degree to which the possible effects are highly uncertain or involve unique or unknown risks; and whether the action has cumulatively significant impacts. *Id.* §§ 1508.27(b).

Furthermore, the Federal Land Policy and Management Act (“FLPMA”), 43 U.S.C. § 1701 *et seq.*, directs that “the public lands be managed in a manner that will protect the quality of [critical resource] values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use.” 43 U.S.C. § 1701(a)(8). This substantive mandate requires that the agency not elevate the development of oil and gas resources above other critical resource values in the planning area. To the contrary, FLPMA requires that where oil and gas development would threaten the quality of critical resources, that conservation of these resources should be the preeminent goal. As detailed below, for several critical resource values in the planning area, the proposed action conflicts with the BLM’s mandate under FLPMA.

A. The BLM Must Take a “Hard Look” at Impacts to Air Quality.

The BLM must take a hard look at the air quality impacts from oil and gas development in the planning area. Much of the air pollution from oil and gas development and operations, which is specifically discussed, below, also degrades visibility. Section 169A of the Clean Air Act (“CAA”), 42, U.S.C. § 7401 *et seq.* (1970) sets forth a national goal for visibility, which is the “prevention of any future, and the remedying of any existing, impairment of visibility in Class I areas which impairment results from manmade air pollution.” Congress adopted the visibility provisions in the CAA to protect visibility in “areas of great scenic importance.” H.R. Rep. No. 294, 95th Cong. 1st Sess. at 205 (1977). In promulgating its Regional Haze Regulations, 64 Fed. Reg. 35,714 (July 1, 1999), the U.S. Environmental Protection Agency (“EPA”) provided:

Regional haze is visibility impairment that is produced by a multitude of sources and activities which emit fine particles and their precursors and which are located across a broad geographic area. Twenty years ago, when initially adopting the visibility protection provisions of the CAA, Congress specifically recognized that the “visibility problem is caused primarily by emission into the atmosphere of SO₂, oxides of nitrogen, and particulate matter, especially fine particulate matter, from inadequate[ly] controlled sources.” H.R. Rep. No. 95-294 at 204 (1977). The fine particulate matter (PM) (e.g., sulfates, nitrates, organic carbon, elemental carbon, and soil dust) that impairs visibility by scattering and absorbing light can cause serious health effects and mortality in humans, and contribute to environmental effects such as acid deposition and eutrophication.

The visibility protection program under sections 169A, 169B, and 110(a)(2)(J) of the CAA is designed to protect Class I areas from impairment due to manmade air pollution. The current regulatory program addresses visibility impairment in these areas that is “reasonably

attributable” to a specific source or small group of sources, such as, here, air pollution resulting from oil and gas development and operations authorized by the Monument Butte FEIS, as well as from other reasonably foreseeable development in the Uinta Basin as analyzed in the Greater Natural Buttes (“GNB”) Final Environmental Impact Statement. *See* 64 Fed. Reg. 35,714.

Moreover, EPA finds the visibility protection provisions of the CAA to be quite broad. Although EPA is addressing visibility protection in phases, the national visibility goal in section 169A calls for addressing visibility impairment generally, including regional haze. *See e.g., State of Maine v. Thomas*, 874 F.2d 883, 885 (1st Cir. 1989) (“EPA’s mandate to control the vexing problem of regional haze emanates directly from the CAA, which ‘declares as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in Class I areas which impairment results from manmade air pollution.’”) (citation omitted).

Here, there are numerous Class I areas within or near the project area that may be impacted by the proposed development, including Arches National Park and Canyonlands National Park, as well as 12 more distant Class I areas. FEIS at 5-4.

In addition to impacts from the proposed development, cumulative air quality impacts from sources in and around the proposed development area may result in serious impairments. For example, there is a tremendous concentration of oil and gas development taking place in the Uinta Basin which has already elevated ozone concentrations, impacted visibility, and seriously degraded air quality in the region. Notably, this includes directly adjacent development proposed by Crescent Point Energy, a 3,925 well project along the Duchesne and Green rivers currently in the scoping phase of NEPA review. As discussed, a proposed Monument Butte project authorizes up to an additional 5,750 oil and gas wells and associated infrastructure, which cannot be sustained in light of cumulative air quality degradation in the area.

The current status of air quality in an area is a fundamental consideration for analysis in the agency’s NEPA analysis. Background monitored concentrations of all pollutants should be reviewed. Given the rapidly expanding development in the area, there may be higher concentrations that should be reflected. As provided by BLM, pollutant emissions from the Monument Butte project have the potential to affect air quality on both a local and a regional scale. FEIS at 4-4. In particular, elevated monitored levels for the 8-hour ozone National Ambient Air Quality Standard (“NAAQS”) in this area in recent years are very concerning. Exposure to ozone is a serious concern as it can cause or exacerbate respiratory health problems, including shortness of breath, asthma, chest pain and coughing, decreased lung function and even lead to long-term lung damage, as discussed in greater detail below. *See also*, EPA’s National Ambient Air Quality Standards for Particulates and Ozone, 62 FR 38,856 (July 18, 1997). According to a recent report by the National Research Council (“NRC”): “short-term exposure to current levels of ozone in many areas is likely to contribute to premature deaths.”¹ Even ozone concentrations at levels as low as 60 ppb can be considered harmful to human health and the

¹ National Research Council, *Link Between Ozone Air Pollution and Premature Death Confirmed*, (April 2008), available at: <http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=12198>.

agencies should consider this when evaluating the air impacts in the EIS.

As provided by the agency:

Potential ozone precursor emissions (NO_x plus VOC) for the [Greater Natural Buttes (“GNB”)] proposed project alone were 8,830 tons per year (tpy). GNB also analyzed the potential ozone impacts of an alternative action, the Optimal Recovery Alternative, with ozone precursor emissions of 29,922 tpy.... Even though the Proposed Action contains more wells and potentially greater emissions than the GNB project (Proposed Action ozone precursor emissions of 16,051 tpy), ... the Proposed Action and GNB would have approximately the same potential ozone impact. FEIS 4-16.

Critically, the BLM failed to consider the stricter EPA ozone standards that were recently finalized. FEIS at 3-4. By court order, EPA’s new ozone standard was required to be finalized by October 1, 2015.² Therefore, EPA’s new NAAQS standard for ozone was not only sufficiently foreseeable, but has been finalized well in advance of BLM’s release of the FEIS, and therefore it should have been included in the agency’s analysis of alternatives and should have guided consideration of the proposed project.

On schedule, on October 1, 2015, EPA published a final rule to revise NAAQS for ozone to 70 parts per billion (ppb) from the current 75 ppb.³ This decision was driven by significant recent scientific evidence that the old standard of 75 ppb did not adequately protect public health. *Id.* at 136. Although EPA faces ongoing challenges to the updated standard—including from industry group and state challenges of the stricter standard, and from citizens advocacy groups alleging that the standard is not protective enough, *Murray Energy Corp. v. EPA*, No. 15-1385 (D.C. Cir.) (and consolidated case Nos. 15-1392, 15-1490, 15-1491, 15-1494)—the current 70 ppb standard is still the relevant regulation BLM should have analyzed, here.

Recent studies have documented decreased lung functioning and airway inflammation in young, healthy adults at ozone concentrations as low as 60 ppb, which supports an even lower standard than the 70 ppb standard adopted by EPA. *Id.* at 146. Studies have documented “significant associations with respiratory emergency department visits with children and adults” in places that met the current standard of 75 ppb, but would not have met the level of 70 ppb. *Id.* at 247. The existing standard is plainly insufficient to protect children with asthma and members of other sensitive groups. *Id.* at 146-47. These impacts will be exacerbated by the worsening impacts of climate change. *Id.* at 33. Specifically, climate change may lead to future increases in summer ozone concentrations across the United States. *Id.*

Ozone concentrations exceeding the NAAQS have been observed during the winter

² See <http://www.epa.gov/groundlevelozone/pdfs/20141125fs-requirements.pdf>; see also, *Sierra Club v. EPA*, No. 13-2809 (N.D. Cal., Apr. 30, 2014).

³ National Ambient Air Quality Standards for Ozone, EPA-HQ-OAR-2008-0699 (Oct. 1, 2015), “Internet version” available at: <http://www3.epa.gov/ozonepollution/pdfs/20151001fr.pdf>

months in the Uinta Basin. The 8-hour ozone pre-project background ambient air quality for the Uinta Basin is $208\mu\text{g}/\text{m}^3$, or 106 ppb, which far exceeds the NAAQS standard.⁴ FEIS at 3-8. The increased oil and gas development that would take place under the proposed action would exacerbate and be an important contributor to the ozone problem in the area. There is no room for growth in emissions that contribute to these harmful levels of ozone pollution in the area – namely, nitrogen oxides (“NO_x”), volatile organic compounds (“VOCs”) and methane (“CH₄”), which the proposed action will exacerbate with emissions of 5,690.1 tpy, 10,360.9 tpy and 12,587 tpy, respectively. *See* Air Quality Technical Support Document (“AQTSD”), Appendix B at 4. After it released the Monument Butte DEIS, the BLM developed a Uinta Basin specific photochemical modeling platform for ozone (the Air Resource Management Strategy, or “ARMS” platform). FEIS 4-15. For the FEIS, the BLM conducted project-specific ARMS modeling. *Id.* Based on the modeling, the baseline plus the Proposed Action shows ozone values of 88.5 ppb and 83.2 ppb in the Uinta Basin Study Area and the Uintah and Ouray Indian reservation, respectively. Rather than adding to the ozone burden in the region, the BLM must take significant steps to decrease emissions and bring the region back into attainment. Any increase in emissions of ozone precursors will exacerbate the negative health effects of ozone in the region, as discussed below, and is almost certain to threaten the area’s compliance with EPA’s ozone standard.

While BLM and project proponent Newfield Exploration are proud of the project goal for “net zero” effect on air pollution, the fact remains that the pre-project background air quality already far exceeds the NAAQS standard. Thus, even the most ambitious air quality mitigation cannot obviate the extremely degraded air quality conditions that already exist—let alone sustain the additional 5,750 Monument Butte wells as well as the additional foreseeable wells in the area.

Additionally, PM_{2.5} is another potential area of major health impacts in the area, with the proposed action planning to add an additional 617.0 tpy. *See* AQTSD, Appendix B at 4. PM_{2.5} can become lodged deep in the lungs or can enter the blood stream, worsening the health of asthmatics and even causing premature death in people with heart and lung disease. Even PM_{2.5} concentrations lower than the current NAAQS are a concern for human health. While background PM_{2.5} values are not at the level of the NAAQS currently, it is likely that those levels will increase with continued development in the area. Elevated wintertime concentrations have become a serious issue, particularly for the Uinta Basin. Several very high values of PM_{2.5} were recorded in Vernal, Utah starting in 2007, including six exceedances of the 24-hour PM_{2.5} NAAQS and a maximum 24-hour average PM_{2.5} concentration of $63\mu\text{g}/\text{m}^3$.⁵ In 2009, there were three recorded exceedances of the 24-hour average PM_{2.5} NAAQS in Roosevelt, Utah with 24-

⁴ The old 8-hour ozone standard of 75 ppb translates to $147\mu\text{g}/\text{m}^3$. The current 8-hour ozone standard of 70 ppb translates to $140\mu\text{g}/\text{m}^3$.

⁵ Marco A Rodriguez, et al., Regional Impacts of Oil and Gas Development on Ozone Formation in the Western United States, JOURNAL OF AIR & WASTE MANAGEMENT ASSOCIATION (Sept. 2009) (attached to DEIS comments).

hour average concentrations reaching 42 $\mu\text{g}/\text{m}^3$ and four recorded exceedances in Vernal with 24-hour average concentrations as high as 60.9 $\mu\text{g}/\text{m}^3$.

Also critical to the BLM's analysis of air quality impacts is the relationship to human health. Logically, the required air quality mitigation measures would have a positive relationship to human health, but poor baseline air quality conditions due to direct, indirect and cumulative impacts in the planning area warrants an independent hard look analysis at human health; and, moreover, such analysis is required by NEPA and CEQ implementing regulations.

Research indicates a strong correlation between oil and gas development and increased ozone concentrations – particularly in the summer when warm, stagnant conditions yield an increase in O_3 from oil and gas emissions.⁶ Particularly in areas of significant existing oil and gas development – such as the San Juan Basin in the Four Corners region, which was the focus of research, here, but certainly also applicable to the Uinta Basin – summertime “peak incremental O_3 concentration of 10 ppb” have been simulated. *Id.* at 1118. This study indicates a “clear potential for oil and gas development to negatively affect regional O_3 concentrations in the western United States, including several treasured national parks such as Arches and Canyonlands. “It is likely that accelerated energy development in this part of the country will worsen the existing problem.”⁷ Additionally, oil and gas production in the mountain West has recently been linked to *winter* ozone levels that greatly exceed the NAAQS.⁸

As the Endocrine Disruption Exchange has noted:

In addition to the land and water contamination issues, at each stage of production and delivery tons of toxic volatile compounds, including benzene, toluene, ethylbenzene, xylene, etc., and fugitive natural gas (methane), escape and mix with nitrogen oxides from the exhaust of diesel-driven, mobile and stationary equipment to produce ground-level ozone. Ozone combined with particulate matter less than 2.5 microns produces smog (haze). Gas field produced ozone has created a serious air pollution problem similar to that found in large urban areas, and can spread up to 200 miles beyond the immediate region where gas is being produced. Ozone not only causes irreversible damage to the lungs, it is equally damaging to conifers, aspen, forage, alfalfa, and other crops commonly grown in the West. Adding to this is the dust created by fleets of diesel-driven water trucks

⁶ See Rodriguez at 1118.

⁷ See *id.*

⁸ See Gail Tonnesen and Richard Payton, EPA Region 8. *Winter Ozone Formation: Results from the Wyoming Upper Green River Basin Studies and Plans for the 2012, Uintah Basin Study* (seminar abstract) (Jan. 2012), available at: <http://www.esrl.noaa.gov/csd/seminars/2012/TonnesenPayton.html> (citing, *inter alia*, Schnell, et. al., *Rapid photochemical production ozone at high concentrations in a rural site during winter*, 2 Nature Geosci. 120-122 (2009) (attached to DEIS comments).

working around the clock hauling the constantly accumulating condensate water from well pads to central evaporation pits.⁹

Increases in ground-level ozone not only impact regional haze and visibility, but can also result in dramatic impacts to human health. According to the EPA:

Breathing ground-level ozone can result in a number of health effects that are observed in broad segments of the population. Some of these effects include:

- Induction of respiratory symptoms
- Decrements in lung function
- Inflammation of airways

Respiratory symptoms can include:

- Coughing
- Throat irritation
- Pain, burning, or discomfort in the chest when taking a deep breath
- Chest tightness, wheezing, or shortness of breath

In addition to these effects, evidence from observational studies strongly indicates that higher daily ozone concentrations are associated with increased asthma attacks, increased hospital admissions, increased daily mortality, and other markers of morbidity. The consistency and coherence of the evidence for effects upon asthmatics suggests that ozone can make asthma symptoms worse and can increase sensitivity to asthma triggers.¹⁰

Oil and gas development is one of the largest sources of VOCs, ozone, sulfur dioxide, and methane emissions in the United States. The relationship between air quality and human health must be analyzed in the agency's NEPA analysis. "The agency must examine the relevant data and articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.'" *Motor Vehicle Mfrs.*, 463 U.S. at 43 (1983).

1. Background Air Quality Concentrations are not Reflective of Current Air Quality Conditions.

Conservation Groups are concerned that the FEIS does not disclose accurate background air quality conditions, particularly with regards to PM_{2.5}, PM₁₀, and nitrogen dioxide. These

⁹ The Endocrine Disruption Exchange. Undated. *Chemicals In Natural Gas Operations: Health Effects Spreadsheet and Summary*, available at: <http://www.endocrinedisruption.com/chemicals.multistate.php> (attached to DEIS comments).

¹⁰ EPA, *Health Effects of Ozone in the General Population*, available at: <http://www.epa.gov/apti/ozonehealth/population.html> (attached to DEIS comments).

background levels are disclosed on page 3-8 of the FEIS, and on page 22 of the AQTSD in Appendix B. The BLM's failure to accurately disclose the affected environment raises serious concerns that the analysis in the EIS is fundamentally flawed. This further raises concerns that the BLM will not assure compliance with the NAAQS.

Conservation Groups are also concerned about BLM's assertions in the FEIS regarding the ozone designation of the Uinta Basin under the Clean Air Act. The BLM is correct that an area that is in violation of the ozone NAAQS is normally designated nonattainment by the EPA. *See* FEIS at 3-4. The EPA may also designate an area as unclassifiable if the available data is not of sufficient quality or quantity to support a designation. *Id.*; *Catawba Cnty, N.C. v. EPA*, 571 F.3d 20, 26 (D.C. Cir. 2009) (citing 42 U.S.C. § 7407(d)(1)(A)(i)-(iii)). The EPA treats "unclassifiable" areas like attainment areas. *Id.*; 42 U.S.C. § 7471. In the case of the Uinta Basin, air quality data demonstrates that the region is in violation of the NAAQS and should be designated as nonattainment. EPA, however, has not made this designation. Instead, the EPA has designated the area as unclassifiable. When the agency conducted the designation process in 2013 for the 2008 NAAQS, it only had regulatory data (as opposed to data from private monitors) for Uinta Basin for 2011 and 2012, whereas the 2008 ozone NAAQS reflect three-year averages of ozone levels. In June of 2015, the D.C. Circuit ruled that EPA did not act arbitrarily and capriciously in designating Uinta Basin as unclassifiable, despite the presence of pre-2011 private monitors that showed ozone levels significantly exceeding the 2008 ozone NAAQS.¹¹ Now, however, regulatory monitors have produced three years of data, which demonstrate that the Uinta Basin is significantly exceeding both the 2008 NAAQS and the recently revised (2015) NAAQS. Thus, the BLM cannot rely on the outdated "unclassifiable" designation as an accurate indicator of air quality in the Uinta Basin.

For PM_{2.5}, it also appears the BLM averaged data from the Ouray and Redwash monitors to determine background air quality conditions for both the annual and 24-hour NAAQS. *See* FEIS, AQTSD at 2. Again, this is inconsistent with how PM_{2.5} air quality conditions are assessed and design values are calculated under 40 C.F.R. § 50, Appendix N.

For PM₁₀, it is unclear how an "average" of three years of data provides an accurate disclosure of the affected environment under NEPA given that compliance with the PM₁₀ NAAQS is based on an "exceedance-based design value" calculated in accordance with 40 C.F.R. § 50, Appendix K. We are also concerned that the FEIS utilizes data from 2004-2006, yet there has been more recent data gathered, including in Uintah County. For instance, at the Dragon Road Monitoring site (ID No. 490475632), monitoring was conducted in 2012 and 2013. In 2012, exceedances of the PM₁₀ NAAQS were reported at this site. We request that the BLM use more recent air quality data to accurately assess background PM₁₀ conditions.

For the 1-hour nitrogen dioxide NAAQS, it also appears the BLM averaged data from the Ouray and Redwash monitors to determine background air quality conditions for the 1-hour NAAQS. *See* FEIS, Appendix B at 22. Again, this is inconsistent with how nitrogen dioxide air quality conditions are assessed and design values are calculated under 40 C.F.R. § 50, Appendix

¹¹ *See Mississippi Comm'n on Env'tl. Quality v. E.P.A.*, 790 F.3d 138 (D.C. Cir. 2015).

S. Furthermore, the BLM's reliance on "eighth-high" values is not consistent with calculating annual 98th percentile values for the 1-hour nitrogen dioxide NAAQS. Although it appears the BLM should base background nitrogen dioxide concentrations on the maximum design value reported in the Uinta Basin, we are concerned even with this approach. Given that the nitrogen dioxide monitoring system in the Uinta Basin is incredibly sparse and inconsistent, it would appear that actual concentrations, particularly near large oil and gas developments such as the Monument Buttes area, are likely much higher. Indeed, according to air monitoring data, the 1-hour nitrogen dioxide NAAQS were exceeded at the Fruitland monitor in Duchesne County in 2013.

2. The Air Quality Analysis Fails to Take into Account the Effects of Cumulative Emissions.

Although the AQTSD takes into account background air quality conditions, it does not appear to take into account cumulative emissions from nearby pollutant emitting activities that may impact near and far-field air quality. Conservation Groups are especially concerned over the cumulative impacts of emissions from existing nearby oil and gas operations to nitrogen dioxide, PM₁₀, and PM_{2.5} concentrations. These sources of emissions could contribute more significantly to near-field impacts, such as nitrogen dioxide emissions from a nearby compressor station stack that may not be effectively monitored. Despite the reported background air quality, which is based only on monitoring data, the location and quantity of emissions from existing nearby sources appears to be a more significant concern with regards to impacts to nitrogen dioxide, PM₁₀, and PM_{2.5} concentrations.

The Annual Emissions Balance Sheet ("AEBS") is a novel and promising approach to addressing air quality in the planning area. Balancing new emissions with reductions in existing emissions, if properly implemented, would serve to prevent increases from current emissions levels. However, simply maintaining emissions at current levels is not a justifiable goal for the Applicant-Committed Environmental Protection Measures ("ACEPMs"). Rather, they should be structured to reduce emissions over time by ratcheting down emissions from the baseline year to achieve improvements in air quality in the region. Below, we discuss the ACEPMs proposed to achieve reductions from drilling and completions, production operations and leak detection and repair ("LDAR"). These ACEPMs must be mandatory and not at the discretion of the applicant as proposed. If they result in compliance with the AEBS net-zero requirement in a given year, then the applicant would have no further emissions reduction obligations. If they do not, applicant would have to achieve further reductions. The measures proposed in the AECPMs are technically proven, commercially available, often profitable, and have been adopted as mandatory requirements by states such as Colorado and in the pending BLM methane waste rule.

The AEBS proposal states that the applicant will calculate VOC emissions using the methods used for calculating the 2014 Uinta Basin Inventory to establish a proposed 2012 baseline year. However, the applicant also states that the existing 2014 Inventory already provides facility-by-facility and source-by-source emissions detail. We see no reason why the existing 2014 Inventory should not be used as the baseline year to avoid the unnecessary effort of calculating a 2012 baseline year.

The AEBS also proposes that the applicant will document VOC reductions and additions that will have sufficient information for BLM to verify the Operator's actions. We believe that the BLM is not equipped to verify the emissions reductions claimed by the applicant. Rather, the applicant should be required to retain the services of a third-party verification provider subject to industry standards and with safeguards against conflicts of interest. The third-party verification provider would be responsible for certifying the accuracy of the information in the annual balance sheet that is submitted to BLM for review and approval.

We also oppose the proposal that reductions in 2015 and 2016 be counted towards reductions required in the first year of the program. This amounts to providing early action credit for reductions that were achieved in the absence of the ACEPMs. Reductions below the baseline should only be counted for the calendar year during which the record of decision is issued and thereafter.

Notably, the AEBS only addresses VOCs. As we have detailed, methane is also a critically important climate pollutant emitted by oil and gas operations. Methane must also be included and accounted for in the AEBS program, either using existing methane emissions reporting in the 2014 Inventory, or using subsequent methane emissions reporting protocols developed subsequent to 2014.

In the absence of any statements to the contrary, the ACEPMs are intended to offset emissions from all of the 5,758 wells, the 21 compressor stations, the gas processing plant and/or 12 oil and gas separation plants, and the 544 miles of pipelines encompassed within the MDP. While the set of ACEPMs proposed are reasonable, they provide too much discretion to the applicant and fail to require emissions reductions measures for important emissions sources such as liquids unloading and pipeline maintenance and repair.

The ACEPMs as proposed "would apply to all Federal lands within the MBPA." However, operations will necessarily involve mixed ownership that cannot be reasonably separated. The proposed BLM methane waste rule establishes within its scope "committed State or private tracts in a federally approved unit or communitization agreement." 81 Fed. Reg. 6682 (Feb. 8, 2016). We believe that the ACEPMs should adopt the approach taken by the pending waste rule to also cover any new facilities on state and private lands within the MDP.

For drilling and completion operations, the ACEPMs commit to the use of reduced-emission completion practices which including "routing all saleable quality gas to a flow line as soon as practicable." The applicant's commitment here is conditioned on the undefined notion of practicability. Presumably, this would mean where no sales line is available, which would defeat the purpose of the measure. Given the density of the proposed infill development and the presence of existing pipeline, compression, and processing capacity, we do not believe that circumstances justify allowing the applicant to route captured gas to sales lines at its discretion. As additional wells are drilled, they will be located in proximity to existing midstream operations. Accordingly, routing gas to a flow line (or for field use) should be required as soon as a well begins production. If new investment in pipeline or compression capacity is required, the well should not produce until this infrastructure is in place. Similarly, this ACEPM proposes to route to a flare any gas that cannot be routed to a flow line due to high pressures. Flares waste

gas, emit CO₂, and contribute to other emissions due to incomplete combustion. We believe the ACEPM should require operating practices such as curtailment of well production until well pressures can be accommodated by flow lines.

With respect to production operations, the applicant proposes an ACEPM to require replacement or retrofit of pneumatic devices at existing facilities with low- or intermittent-bleed devices. The ACEPM should require only low-bleed or no-bleed devices, such as electric or air driven controllers. Since the applicant proposes the use of electric motor driven compression, we believe that a similar commitment should be made for pneumatic controllers where electric power is available. Intermittent-bleed pneumatic devices emit significant amounts of gas and would not be as effective at offsetting new sources of emissions as low- and no-bleed controllers. The production ACEPM also proposes emissions controls for glycol dehydrators. Desiccant dehydrators are proven and effective in limiting emissions and should be included as an alternative to glycol dehydrators. The ACEPM also proposes to control storage tank emissions “on tanks that have been constructed, modified or re-constructed after August 23, 2011.” We see no reason to exclude older tanks that are likely to have greater levels of emissions. Further, the applicant proposes to “periodically replace rod packing systems on reciprocating compressors and when feasible use dry seals on centrifugal compressors to minimize the loss of VOC.” We believe that applicant should commit to a specific rod packing system maintenance schedule and to replace wet seals with dry seals on existing centrifugal compressors and use dry seals on all new centrifugal compressors.

The applicant’s approach to LDAR is wholly inadequate. It proposes using outdated audio-visual-olfactory methods to conduct leak inspections, to use IR cameras for only “at least 10%” of facility inspections, to conduct such inspections on an annual basis, and to repair observed leaks within timeframes to be determined in the future (i.e., “Newfield will develop, and submit for BLM approval, a corrective action plan for the Project Area that would include appropriate timeframes to complete necessary repairs that may be identified in the future through the Monitoring Program”). New rules for LDAR in Colorado require inspections at greater frequency when A-V-O methods are used, inspections either monthly or quarterly for higher-emissions equipment, and leaks to be repaired within five days of detection. The proposed BLM waste rule requires the use of IR cameras unless exemptions are specifically sought, inspections at least semi-annually, and repairs to be made within 15 days. We believe that the LDAR program must be modeled on these standards.

Finally, we find that Table 4.2.1.1.1-3 is deficient. It should include methane emissions, and a companion table that shows emissions reductions that are forecast to offset the additional emissions resulting from the annual development of proposed action.

B. The BLM Must Take a “Hard Look” at Climate Change.

If we are to stem the impacts of climate change and manage for sustainable ecosystems, not only must the BLM take a hard look at greenhouse gas (“GHG”) emissions from the proposed development, but its decision must be reflective of the challenges we face.

The EPA has determined that human emissions of greenhouse gases are causing global warming that is harmful to human health and welfare. *See* 74 Fed. Reg. 66,496 (Dec. 15, 2009), Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act. The D.C. Circuit has upheld this decision as supported by the vast body of scientific evidence on the subject. *See Coal. for Responsible Regulation, Inc. v. E.P.A.*, 684 F.3d 102, 120-22 (D.C. Cir. 2012). Indeed, EPA could not have found otherwise, as virtually every climatologist in the world accepts the legitimacy of global warming and the fact that human activity has resulted in atmospheric warming and planetary climate change.¹² The world's leading minds and most respected institutions – guided by increasingly clear science and statistical evidence – agree that dramatic action is necessary to avoid planetary disaster.¹³ GHG concentrations have been steadily increasing over the past century,¹⁴ and our growing consumption of fossil fuels is pushing the world to a tipping point where, once reached,

¹² *See, e.g., See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *The Science of Climate Change* (1995) (attached to DEIS comments); U.S. Climate Change Science Program, *Abrupt Climate Change* (Dec. 2008) (attached to DEIS comments); James Hansen, et. al., *Global Surface Temperature Change*, REVIEWS OF GEOPHYSICS, 48, RG4004 (June 2010) (attached to DEIS comments); *see also*, Richard A. Muller, *Conversion of a Climate Change Skeptic*, NEW YORK TIMES, July 28, 2012 (attached to DEIS comments) (citing Richard A. Muller, et. al., *A New Estimate of the Average Earth Surface Temperature, Spanning 1753 to 2011*, (attached to DEIS comments); Richard A. Muller, et. al., *Decadal Variations in the Global Atmospheric Land Temperatures* (attached to DEIS comments)).

¹³ *See, e.g.,* Rob Atkinson, et. al., *Climate Pragmatism: Innovation, Resilience, and No Regrets* (July 2011) (attached to DEIS comments); Veerabhadran Ramanathan, et. al., *The Copenhagen Accord for Limiting Global Warming: Criteria, Constraints, and Available Avenues* (Feb. 2010) (attached to DEIS comments); UNITED NATIONS, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *Climate Change 2007: Synthesis Report* (2007) (attached to DEIS comments); A.P. Sokolov, et. al., *Probabilistic Forecast for Twenty-First-Century Climate Based on Uncertainties in Emissions (without Policy) and Climate Parameters*, MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT) (Oct. 2009) (attached to DEIS comments); UNITED NATIONS, FRAMEWORK CONVENTION ON CLIMATE CHANGE, *Report of the Conference of the Parties* (Dec. 2011) (attached to DEIS comments); Bill McKibben, *Global Warming's Terrifying New Math*, ROLLING STONE, July 19, 2012 (attached to DEIS comments); Elizabeth Muller, *250 Years of Global Warming*, BERKLEY EARTH, July 29, 2012 (attached to DEIS comments); Marika M. Holland, et. al., *Future abrupt reductions in summer Arctic sea ice*, Geophysical Research Letters, Vol. 33, L23503 (2006) (attached to DEIS comments);

¹⁴ *See* Randy Strait, et. al., *Final Colorado Greenhouse Gas Inventory and Reference Case Projections: 1990-2020*, CENTER FOR CLIMATE STRATEGIES (Oct. 2007) (attached to DEIS comments); Robin Segall et. al., *Upstream Oil and Gas Emissions Measurement Project*, U.S. ENVIRONMENTAL PROTECTION AGENCY (attached to DEIS comments); Lee Gribovicz, *Analysis of States' and EPA Oil & Gas Air Emissions Control Requirements for Selected Basins in the Western United States*, WESTERN REGIONAL AIR PARTNERSHIP (Nov. 2011) (attached to DEIS comments).

catastrophic change will be unavoidable.¹⁵ In fact, the impacts from climate change are already being experienced, with drought and extreme weather events becoming increasingly common.¹⁶

Renowned NASA climatologist, Dr. James Hansen, provides the analogy of loaded dice – suggesting that there still exists some variability, but that climate change is making these extreme events ever more common.¹⁷ In turn, climatic change and GHG emissions are having dramatic impacts on plant and animal species and habitat, threatening both human and species resiliency and the ability to adapt to these changes.¹⁸ According to experts at the Government Accountability Office (“GAO”), federal land and water resources are vulnerable to a wide range of effects from climate change, some of which are already occurring. These effects include, among others, “(1) physical effects, such as droughts, floods, glacial melting, and sea level rise; (2) biological effects, such as increases in insect and disease infestations, shifts in species distribution, and changes in the timing of natural events; and (3) economic and social effects, such as adverse impacts on tourism, infrastructure, fishing, and other resource uses.”¹⁹

¹⁵ See, e.g., James Hansen, *Tipping Point: Perspective of a Climatologist*, STATE OF THE WILD 2008-2009 (attached to DEIS comments); GLOBAL CARBON PROJECT, *A framework for Internationally Co-ordinated Research on the Global Carbon Cycle*, ESSP Report No. 1 (attached to DEIS comments); INTERNATIONAL ENERGY AGENCY, *CO₂ Emissions from Fuel Combustion*, Highlights 2011 (attached to DEIS comments); GLOBAL CARBON PROJECT, *10 Years of Advancing Knowledge on the Global Carbon Cycle and its Management* (attached to DEIS comments); Malte Meinshausen, et. al., *Greenhouse-gas emission targets for limiting global warming to 2° C*, NATURE, Vol. 458, April 30, 2009 (attached to DEIS comments).

¹⁶ See, e.g., UNITED NATIONS, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation* (2011) (attached to DEIS comments); Aiguo Dai, *Increasing drought under global warming in observations and models*, NATURE: CLIMATE CHANGE (Aug. 2012) (attached to DEIS comments); Stephen Saunders, et. al., *Hotter and Drier: The West's Changed Climate* (March 2008) (attached to DEIS comments).

¹⁷ See, James Hansen, et. al., *Climate Variability and Climate Change: The New Climate Dice* (Nov. 2011) (attached to DEIS comments); James Hansen, et. al., *Perception of Climate Change* (March 2012) (attached to DEIS comments); James Hansen, et. al., *Increasing Climate Extremes and the New Climate Dice* (Aug. 2012) (attached to DEIS comments).

¹⁸ See Fitzgerald Booker, et. al., *The Ozone Component of Climate Change: Potential Effects on Agriculture and Horticultural Plant Yield, Product Quality and Interactions with Invasive Species*, J. INTEGR. PLANT BIOL. 51(4), 337-351 (2009) (attached to DEIS comments); Peter Reich, *Quantifying plant response to ozone: a unifying theory*, TREE PHYSIOLOGY 3, 63-91 (1987) (attached to DEIS comments).

¹⁹ GAO Report, *Climate Change: Agencies Should Develop Guidance for Addressing the Effects on Federal Land and Water Resources* (2007) (attached to DEIS comments); see also Committee on Environment and Natural Resources, National Science and Technology Council, *Scientific Assessment of the Effects of Global Climate Change on the United States* (2008) (attached to

Despite the strength of these findings, the BLM has historically failed to take serious action to address climate change impacts. This type of dismissive approach fails to satisfy the guidance outlined in Department of Interior Secretarial Order 3226, discussed below, or the requirements of NEPA. “Reasonable forecasting and speculation is . . . implicit in NEPA, and we must reject any attempt by agencies to shirk their responsibilities under NEPA by labelling any and all discussion of future environmental effects as ‘crystal ball inquiry.’” *Save Our Ecosystems v. Clark*, 747 F.2d 1240, 1246 n.9 (9th Cir. 1984 (quoting *Scientists’ Inst. for Pub. Info., Inc. v. Atomic Energy Comm.*, 481 F.2d 1079, 1092 (D.C. Cir. 1973))).

As noted above, NEPA imposes “action forcing procedures . . . requir[ing] that agencies take a *hard look* at environmental consequences.” *Methow Valley*, 490 U.S. at 350 (citations omitted) (emphasis added). These “environmental consequences” may be direct, indirect, or cumulative. 40 C.F.R. §§ 1502.16, 1508.7, 1508.8. BLM is required to take a hard look at those impacts as they relate to the agency action. “Energy-related activities contribute 70% of global GHG emissions; oil and gas together represent 60% of those energy-related emissions through their extraction, processing and subsequent combustion.”²⁰ Even if science cannot isolate each additional oil or gas well’s contribution to these overall emissions, this does not obviate BLM’s responsibility to consider oil and gas development in the action area from the cumulative impacts of the oil and gas sector. In other words, the BLM cannot ignore the larger relationship that oil and gas management decisions have to the broader climate crisis that we face. Here, the agency’s analysis must include the full scope of GHG emissions. *See Neighbors of Cuddy Mountain v. U.S. Forest Service*, 137 F.3d 1372, 1379 (9th Cir. 1998) (“To ‘consider’ cumulative effects, some quantified or detailed information is required. Without such information, neither the courts nor the public, in reviewing the [agency’s] decisions, can be assured that the [agency] provided the hard look that it is required to provide.”). If we are to stem climate disaster – the impacts of which we are already experiencing – the agency’s decisionmaking must be reflective of this reality and plan accordingly.

BLM is, at the end of the day, responsible for the management of 700 million acres of federal onshore subsurface minerals.²¹ Indeed, “in 2012, the most recent year for which total U.S. GHG emissions data were available, the estimated 1,344 MMTCO_{2e} in ultimate downstream GHG emissions from fossil fuel extraction from federal lands by private leaseholders could have accounted for approximately 21% of total U.S. GHG emissions and 24%

DEIS comments); Melanie Lenart, et. al. *Global Warming in the Southwest: Projections, Observations, and Impacts* (2007) (attached to DEIS comments) (describing impacts from temperature rise, drought, floods and impacts to water supply on the southwest).

²⁰ International Investors Group on Climate Change, *Global Climate Disclosure Framework for Oil and Gas Companies* (attached to DEIS comments).

²¹ See DOI-BLM, *Mineral and Surface Acreage Managed By BLM*, available at: http://www.blm.gov/wo/st/en/info/About_BLM/subsurface.html.

of energy-related GHG emissions.”²² In 2010, the GAO estimated that BLM could eliminate up to 40% of methane emissions from federally authorized oil and natural gas development, the equivalent of eliminating 39.2 Bcf or 65 MMTCO₂e of GHG pollution annually and equivalent to roughly 19 coal-fired power plants.²³ To suggest that the agency does not, here, have to account for GHG pollution from oil and gas development authorized by the Monument Butte MDP, would be to suggest that the collective 700 million acres of subsurface mineral estate is not relevant to protecting against climate change. This sort of flawed, reductive thinking would be problematic, and contradicted by the agency’s very management framework that provides a place-based lens to account for specific pollution sources to ensure that the broader public interest is protected. Therefore, even though climate change emissions from the proposed action may look minor when viewed in isolation, when considered cumulatively with all of the other GHG emissions from BLM-managed land, they become significant and cannot be ignored.

Unfortunately, this type of dismissive approach is precisely what BLM advanced in the Monument Butte FEIS. Despite a plan that could yield over 334.9 million barrels of oil, 540,669 million cubic feet of natural gas, 10,085 million barrels of natural gas liquids, and 6.9 trillion cubic feet of natural gas from the deep gas development through 2035, the agency later offers that the approximately 3.3 million metric tons of CO₂e produced annually “are less than about five hundredths of a percent of the U.S. total shown for 2010 and about 3 percent of the state-wide total projected for 2020.” FEIS 5-8, 5-9.

Moreover, research conducted by the National Research Council has confirmed the fact that the negative impacts of energy generation from fossil fuels are not represented in the market price for such generation.²⁴ In other words, failing to internalize the externalities of energy generation from fossil fuels – such as the impacts to climate change and human health – has resulted in a market failure that requires government intervention. The agency should be mindful

²² Stratus Consulting, prepared for: The Wilderness Society, *Greenhouse Gas Emissions from Fossil Energy Extracted from Federal Lands and Waters: An Update*, December 23, 2014 (attached to DEIS comments).

²³ GAO, *Federal Oil & Gas Leases: Opportunities Exist to Capture Vented and Flared Natural Gas, Which Would Increase Royalty Payments and Reduce Greenhouse Gases*, GAO-11-34 at 12 (Table 1)(October 2010) (attached to DEIS comments). This GHG equivalence assumes a CH₄ warming potential of 86 (20-year warming period) as per the Intergovernmental Panel on Climate Change’s Fifth Assessment Report and using EPA’s GHG equivalencies calculator.

²⁴ See, e.g., National Research Council, *Hidden Costs of Energy: Unpriced Consequences of Energy Production and Use* (2010) (attached to DEIS comments); Nicholas Muller, et. al., *Environmental Accounting for Pollution in the United States Economy*, AMERICAN ECONOMIC REVIEW at 1649-1675 (Aug. 2011) (attached to DEIS comments); see also, Generation Investment Management, *Sustainable Capitalism*, (Jan. 2012) (advocating a paradigm shift to *Sustainable Capitalism*; “a framework that seeks to maximize long-term economic value creation by reforming markets to address real needs while considering *all* costs and stakeholders.”) (attached to DEIS comments).

of this cost failure as they evaluate our nation’s dependence on dirty energy from oil and gas – particularly as it relates to other incompatible resource values deserving protection in the planning area. Moreover, the federal working group addressing the social cost of carbon (“SCC”) recently released new estimates that revise significantly upward the costs associated with GHG pollution, with median impacts pegged at \$43 and \$65 per ton.²⁵ The BLM’s analysis must meaningfully contemplate a transition to renewable energy generation; not only as an alternative which may eventually suppress demand for oil and gas resources, but also as a pathway toward mitigating climate change as it relates to agency decisionmaking on federal lands.²⁶

Agency decisionmaking must be reflective of this broader reality, and the agency’s failure to account for the full lifecycle of oil and gas production represents a fundamental deficiency in its NEPA analysis—an obligation recently underscored by The White House Council on Environmental Quality in *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and Effects of Climate Change in National Environmental Policy Act Reviews* (August 1, 2016) (attached as Exhibit 1). As discussed more fully below, BLM not only has the authority, but an obligation to address GHG emissions and methane waste. Furthermore, the agency must consider not only the cumulative impact of the GHG emissions authorized by the proposed action, it must also consider those emissions combined with other activity in the area. As noted above, “[t]he impact of greenhouse gas emissions on climate change is precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct.” *Ctr. for Biological Diversity*, 538 F.3d 1172, 1217. The agency must assess cumulative impacts, particularly, as here, the cumulative impacts of climate change. Failure to do so would “impermissibly subject[s] the decisionmaking process contemplated by NEPA to ‘the tyranny of small decisions.’ ” *Kern*, 284 F.3d at 1078 (citation omitted).

1. Methane Emissions and Waste

The agency must take a hard look, and take meaningful action, to address the serious issue of methane (“CH₄”) emissions and waste in the oil and gas production process. Such action must include an estimate of the projected methane emission rates from drilling and production activities authorized by the proposed action. As shown in Table 4.2.1.1.1-1 (FEIS 4-7) and in Appendix B, Table 1.1, methane emissions from the proposed project will be significant, and the agency is obligated to conduct a detailed analysis of measures available to mitigate such emissions and not limit its view to the ACEPMs proposed by the project proponent.

Methane emission rates can differ quite dramatically from one oil and gas field to the

²⁵ See Interagency Working Group on the Social Cost of Carbon, United States Government, *Technical Support Document: Technical Update on the Social Cost of Carbon for Regulatory Impact Analysis – Under Executive Order 12866* (May 2013) (attached to DEIS comments).

²⁶ See, e.g., INTERNATIONAL ENERGY AGENCY, *Energy Technology Perspectives 2012: Pathways to a Clean Energy System* (2012) (attached to DEIS comments); UNITED NATIONS, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *Renewable Energy Sources and Climate Change Mitigation* (2012) (attached to DEIS comments).

next, and, depending on the type of mitigation and emission controls employed, natural gas production emissions have been found to average 5.4%²⁷ and can range anywhere from 1% to 12% of production. A series of peer-reviewed studies have shown leakage rates for individual sources in the natural gas supply chain and in Western basins to be much higher than that estimated by EPA.²⁸

Assuming a lower-bound leak rate of 1% – which is approximately one-third lower than the EPA estimate of methane emissions in the Inventory of U.S. GHG Emissions and Sinks: 1990-2011²⁹ – methane emissions from gas production by the proposed action could represent a meaningful contribution of emissions over the life of the developed field.³⁰ Assuming an upper-bound leak rate of 12%, particularly relevant, here, the high end of the rate found in a 2012 study

²⁷ Brandt, A. F., G. A. Heath, E. A. Kort, F. O. O’Sullivan, G. Petron, S. M. Jordaan, et al. 2014. *Methane leaks from North American natural gas systems*. Science 343:733–735 (finding average methane emissions from natural gas production of 5.4%) (attached as Exhibit 2).

²⁸ See, e.g., David T. Allen, et. al., *Measurements of methane emissions at natural gas production sites in the United states*, PNAS (August. 19, 2013) (finding emissions as low as 1.5% of production at select sites) (attached to DEIS comments); Mitchell, A.L., et al., (2015), *Measurements of Methane Emissions from Natural Gas Gathering Facilities and Processing Plants: Measurement Results*, ENVIRON. SCI. TECHNOL., 49, at 3219-3227 (finding leakage rates from gas gathering and processing infrastructure of 8 times greater than EPA estimates) (attached as Exhibit 3); David T. Allen et al., *Methane Emissions from Process Equipment at Natural Gas Production Sites in the United States: Pneumatic Controllers*, ENVIRONMENTAL SCIENCE AND TECHNOLOGY, 636 and 638 (Dec. 9, 2014) (finding leakage rates from pneumatic controllers three times greater than EPA estimates) (attached as Exhibit 4); Lyon, et al., (2016) *Aerial surveys of elevated hydrocarbon emissions from oil and gas production sites*, ENVIRON. SCI. TECHNOL., Web publication April 5, 2016 (finding high leak rates from storage tanks) (attached as Exhibit 5); Anna Karion, et. al., *Methane emissions estimate from airborne measurements over a western United States gas field*, GEOPHYSICAL RESEARCH LETTERS (Aug. 27, 2013) (finding emissions of 6 to 12 percent, on average, in the Uintah Basin) (attached to DEIS comments); Gabrielle Pétron et al., *A new look at methane and nonmethane hydrocarbon emissions from oil and natural gas operations in the Colorado Denver-Julesburg Basin*, Journal of Geophysical Research: Atmospheres, 6836 (June 3, 2014) (finding leak rates averaging 4% in the Denver-Julesburg Basin) (attached as Exhibit 6). See also, Joe Romm, *Study of Best Fracked Wells Finds Low Methane Emissions But Skips Super-Emitters*, CLIMATE PROGRESS (September 19, 2013), available at: <http://thinkprogress.org/climate/2013/09/19/2646881/study-fracked-wells-methane-emissions-super-emitters/>. See also GAO-11-34 (2010) at 25 (using a conversion factor of .4045 MMTCO₂e/Bcf for vented gas) (attached to DEIS comments).

²⁹ See U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011* (April 2013) (attached to DEIS comments).

³⁰ See U.S. Environmental Protection Agency, *Greenhouse Gas Equivalencies Calculator*, available at: <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>.

using air sampling over the Uinta Basin,³¹ methane emissions from gas could be truly significant indeed. Although there is substantial variability between the 1% and 12% emission leak rates – and, even without specific data from the proposed action, we can assume leakage somewhere between these two extremes – even at the low end emissions would not be trivial.

Even setting aside the issue of climate change, every ton of methane emitted to the atmosphere from oil and gas development is a ton of natural gas *lost*. Every ton of methane lost to the atmosphere is therefore a ton of natural gas that cannot be used by consumers. Methane lost from federal leases will also not yield royalties otherwise shared between federal, state, and local governments. This lost gas reflects serious inefficiencies in how BLM oil and gas leases are developed. Energy lost from oil and gas production – whether avoidable or unavoidable – reduces the ability of a lease to supply energy, increasing the pressure to drill other lands to supply energy to satisfy demand. 40 C.F.R. §§ 1502.16(e)-(f). In so doing, inefficiencies create indirect and cumulative environmental impacts by increasing the pressure to satisfy demand with new drilling. 40 C.F.R. §§ 1508.7, 1508.8(b).

a. Mineral Leasing Act’s duty to prevent waste.

Conservation Groups, and in particular WELC, have been urging BLM field offices throughout the West to adopt common sense and economical measures to address the issue of vented and fugitive methane waste. The agency has expansive authority – and, indeed, the responsibility and opportunity – to prevent the waste of oil and gas resources, in particular methane, which is the primary constituent of natural gas. The Mineral Leasing Act of 1920 (“MLA”) provides that “[a]ll leases of lands containing oil or gas ... shall be subject to the condition that the lessee will, in conducting his explorations and mining operations, use all reasonable precautions to prevent waste of oil or gas developed in the land....” 30 U.S.C. § 225; *see also* 30 U.S.C. § 187 (“Each lease shall contain...a provision...for the prevention of undue waste....” As the MLA’s legislative history teaches, “conservation through control was the dominant theme of the debates.” *Boesche v. Udall*, 373 U.S. 472, 481 (1963) (citing H.R.Rep. No. 398, 66th Cong., 1st Sess. 12-13; H.R.Rep. No. 1138, 65th Cong., 3d Sess. 19 (“The legislation provided for herein...will [help] prevent waste and other lax methods....”)).

BLM’s implementing regulations, reflecting these provisions, currently provide that “[t]he objective” of its MLA regulations in 43 C.F.R. Subpart 3160 “is to promote the orderly and efficient exploration, development and production of oil and gas. 43 C.F.R. § 3160.0-4. In part, “orderly and efficient” operations are ensured through unitization or communitization agreements. 43 C.F.R. §§ 3161.2, 3162.2-4(b) (BLM authority to require lessees unitization or communitization agreements); 43 C.F.R. Subpart 3180 (general rules pertaining to drilling unit agreements). Such unit agreements, because they may limit BLM authority in subsequent stages, are therefore important tools for preventing waste. *See William P. Maycock et al.*, 177 IBLA 1,

³¹ *See* Brian Maffly, *Uinta Basin gas leakage far worse than most believe*, THE SALT LAKE TRIBUNE (Aug 05, 2013), available at: <http://www.sltrib.com/sltrib/news/56692751-78/basin-carbon-emissions-gas.html.csp> (“Between 6 percent and 12 percent of the Uinta Basin’s natural gas production could be escaping into the atmosphere.”).

20-21 (Dec. Int. 2008) (“BLM is not required to analyze an alternative that is [n]ot feasible because it is inconsistent with the basic presumption of the Unit Agreement and BLM cannot legally compel the operator to adopt that alternative under the terms of the Unit Agreement”).

Critically, subpart 3160 specifically requires BLM officials to ensure “that all [oil and gas] operations be conducted in a manner which protects other natural resources and the environmental quality, protects life and property and results in the maximum ultimate recovery of oil and gas with minimum waste and with minimum adverse effect on the ultimate recovery of other mineral resources.” 43 C.F.R. § 3161.2 (emphasis added). The lease owner and/or operator is, similarly, charged with “conducting all operations in a manner which ensures the proper handling, measurement, disposition, and site security of leasehold production; which protects other natural resources and environmental quality; which protects life and property; and which results in maximum ultimate economic recovery of oil and gas with minimum waste and with minimum adverse effect on ultimate recovery of other mineral resources.” 43 C.F.R. § 3162.1(a) (emphasis added). Waste is defined as “(1) A reduction in the quantity or quality of oil and gas ultimately producible from a reservoir under prudent and proper operations; or (2) avoidable surface loss of oil or gas.” 43 C.F.R. § 3160.0-5. Avoidable losses of oil or gas are currently defined as including venting or flaring without authorization, operator negligence, failure of the operator to take “all reasonable measures to prevent and/or control the loss,” and an operator’s failure to comply with lease terms and regulations, order, notices, and the like. *Id.*

In many respects, we think that BLM’s current rules can be tightened. Regardless, it is clear that BLM’s expansive authority, responsibility, and opportunity to prevent waste must permeate the agency’s full planning and decisionmaking processes for oil and gas. The agency must ensure that any development authorized by the proposed action take advantage of not only proven, often economical technologies and practices to prevent methane waste, but, further, the agency’s tools to ensure the orderly and efficient exploration, development, and production of oil and gas through controls placed on the very scale, pace, and nature of development. Moreover, it is clear that BLM’s authority, responsibility, and opportunity extends to both existing and future oil and gas development. BLM, ultimately, manages the federal – i.e., publicly owned – onshore oil and gas resource in trust for the American people.

On November 19, 2013, a coalition of over 90 environmental, health, and sporting organizations submitted an open letter to Secretary Jewell of the U.S. Department of Interior and Administrator McCarthy of the U.S. Environmental Protection Agency calling for action to substantially reduce emissions of methane from the oil and gas industry on public and private lands, as well as from offshore oil operations. The coalition called on Secretary Jewell to reduce emissions from oil and gas operations on public lands by updating decades-old BLM rules on waste of mineral resources. Further, we asked Administrator McCarthy to directly regulate methane emissions from the oil and gas industry using existing Clean Air Act authority and to develop nationwide curbs on GHG emissions.

Notably, BLM is currently undertaking federal rulemaking pertaining to Onshore Oil and Gas Order No. 9, Waste Prevention and Use of Produced Oil and Gas for Beneficial Purposes. *See* 43 C.F.R. § 3164.1 (authorizing the Director to issue Onshore Oil and Gas Orders to

implement or supplement regulations). On February 8, 2016, the BLM released a proposed rule. The agency provided:

This proposed regulation aims to reduce the waste of natural gas from mineral leases administered by the BLM. This gas is lost during oil and gas production activities through flaring or venting of the gas, and equipment leaks. While oil and gas production technology has advanced dramatically in recent years, the BLM's requirements to minimize waste of gas have not been updated in over 30 years. The Mineral Leasing Act of 1920 (MLA) requires the BLM to ensure that lessees "use all reasonable precautions to prevent waste of oil or gas developed in the land" 30 U.S.C. 225. The BLM believes there are economical, cost-effective, and reasonable measures that operators should take to minimize waste, which will enhance our nation's natural gas supplies, boost royalty receipts for American taxpayers, tribes, and States, and reduce environmental damage from venting and flaring.

Waste Prevention, Production Subject to Royalties, and Resource Conservation: Proposed Rule, 81 Fed. Reg. 6616, (February 8, 2016). The BLM must consider this federal rulemaking, and the implications that this rule would have on place-based action, such as the establishment of mandatory requirements to prevent methane venting, flaring and leaks, on the Monument Butte MDP, in its planning level decisionmaking.

The Western Environmental Law Center and our partners also recently submitted comments on this proposed rule, as did the Sierra Club in joint comments with other partner organizations. These comments are incorporated herein, attached hereto as Exhibit 7, and must also be considered by the VFO when undertaking the Monument Butte EIS planning process. *See* 40 C.F.R. § 1502.9(c)(1)(ii).

b. President Obama's Climate Action Plan and Secretarial Order 3289.

President Obama's June Climate Action Plan explains that "[c]urbing emissions of methane is critical to our overall effort to address global climate change." *See* Climate Action Plan at 10. The President's call for action ties in nicely with BLM's authorities and responsibilities, beyond the MLA, to reduce methane emissions.

The starting point is the Federal Land Policy and Management Act of 1976 ("FLPMA"). Pursuant to FLPMA, the agencies must manage the public lands:

in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition, that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use.

43 U.S.C. § 1701(a)(8) (emphasis added). The BLM, as a multiple use agency, must also manage

the public lands and the oil and natural gas resource to “best meet the present and future needs of the American people” and to ensure that management “takes into account the long-term needs of future generations for... non-renewable resources, including... minerals.” 43 C.F.R. § 1702(c). Put differently, the driving force behind agency-authorized oil and gas development is the long-term, and broad, public interest – not the often short-term, and narrow, interest of oil and gas companies. The agencies duty to prevent waste must account for this driving force.

Here, BLM must ensure that these objectives and duties are adhered to through the completion of its NEPA analysis, which must, *inter alia*, “use and observe the principles of multiple use and sustained yield” and “weigh long-term benefits to the public against short-term benefits.” *See* 43 U.S.C. § 1712(c)(1), (7). Thus, the VFO has a substantive duty to consider the enduring legacy of oil and gas development in land management decisionmaking, which is to be balanced against other critical multiple use resource values.

Additionally, the BLM, as an agency within the U.S. Department of Interior, is subject to Secretarial Order 3289 (Dept. Int. Sept. 14, 2009). Secretarial Order 3289, in section 3(a), provides that BLM “must consider and analyze climate change impacts when undertaking long-range planning exercises, setting priorities for scientific research and investigations, developing multi-year management plans, and making major decisions regarding potential use of resources under the Department’s purview.” Section 3(a) of Secretarial Order 3289 also reinstated Secretarial Order 3226 (January 19, 2001). Secretarial Order 3226 commits the Department of the Interior to address climate change through its planning and decisionmaking processes. As the Order explains, “climate change is impacting natural resources that the Department of the Interior (Department) has the responsibility to manage and protect.” Sec. Or. 3226, § 1. The Order therefore “ensures that climate change impacts are taken into account in connection with Department planning and decision making.” *Id.* The Order obligates BLM to “consider and analyze potential climate change impacts” in four situations: (1) “when undertaking long-range planning exercises”; (2) “when setting priorities for scientific research and investigations”; (3) “when developing multi-year management plans, and/or” (4) “when making major decisions regarding the potential utilization of resources under the Department’s purview.” *Id.* § 3. The Order specifically provides that “Departmental activities covered by this Order” include “management plans and activities developed for public lands” and “planning and management activities associated with oil, gas and mineral development on public lands.” *Id.* (emphasis added). BLM’s oil and gas decisions are thus contemplated by and subject to section 3 of the Order.

These authorities and responsibilities can be properly exercised through effective use of NEPA. To comply with NEPA, the BLM must take a hard look at direct, indirect, and cumulative impacts, as discussed above. 40 §§ C.F.R. 1502.16(a), (b); 1508.25(c). In evaluating impacts, the agency must discuss “[e]nergy requirements and conservation potential of various alternatives and mitigation measures,” “[n]atural or depletable resource requirements and conservation potential of various alternatives and mitigation measures,” and “[m]eans to mitigate adverse environmental impacts (if not fully covered under 1502.14(f)).” 40 C.F.R. §§ 1502.16(e), (f), (h).

We emphasize, here, the “heart” of the NEPA process: BLM’s duty to consider “alternatives to the proposed action” and to “study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.” 42 U.S.C. §§ 4332(2)(C)(iii), 4332(2)(E); 40 C.F.R. § 1502.14(a). Alternatives are critical because, “[c]learly, it is pointless to ‘consider’ environmental costs without also seriously considering action to avoid them.” *Calvert Cliffs’ Coordinating Comm., Inc. v. U.S. Atomic Energy Commn.*, 449 F.2d 1109, 1128 (D.C. Cir. 1971). Operating in concert with NEPA’s mandate to address environmental impacts, BLM’s fidelity to alternatives analysis helps “sharply defin[e] the issues and provid[e] a clear basis for choice among options by the decision maker and the public.” 40 C.F.R. § 1502.14. An agency must, accordingly, “[r]igorously explore and objectively evaluate all reasonable alternatives” and specifically “[i]nclude the alternative of no action.” 40 C.F.R. §§ 1502.14(a), (d). Conservation Groups strongly recommend—given significant background air quality degradation and the mounting threat of climate change—that the agency adopt the no action alternative. The VFO should also consider the alternative of making the ACEPM’s mandatory COAs for all drilling approval, and add available methane mitigation measures that are not currently included in the proposed ACEPMs.

Finally, even where impacts are “insignificant,” BLM must still consider alternatives. *Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1229 (9th Cir. 1988) (agency’s duty to consider alternatives “is both independent of, and broader than,” its duty to complete an environmental analysis); *Greater Yellowstone Coalition v. Flowers*, 359 F.3d 1257, 1277 (10th Cir. 2004) (duty to consider alternatives “is ‘operative even if the agency finds no significant environmental impact’”).

c. Methane mitigation measures should be adopted and analyzed.

In BLM’s proposed methane waste rule, there are many sources of methane emissions from oil and gas development that are identified and a few significant sources that are not included. The proposed rule also includes widely recognized methane emissions mitigation measures and best management practices (“BMPs”). The sources of methane emissions which will be present within the area of development, and the mitigation measures available, must be considered by BLM in its analysis of the proposed action.

Important sources of methane emissions include:

- Well drilling
- Well completion
- Production testing
- Pneumatic controllers
- Pneumatic pumps
- Separators and dehydrators
- Compressors
- Pipelines
- Storage tanks
- Liquids unloading

- Leaks
- Associated gas from oil wells

While we commend the measures included in the proposed ACEPMs, many are conditional or incomplete, which undermine these commitments. These include:

- Use of reduced-emission completion practices including “routing all saleable quality gas to a flow line as soon as practicable”
- Emission controls for new existing glycol dehydrators but not for retrofitting existing dehydrators
- Emission controls only for storage tanks built before August 2011
- Electric compression where feasible
- When feasible use of dry seals on centrifugal compressors
- Periodic replacement of rod packing systems on reciprocal compressors
- Use of AVO leak detection on an annual basis, and use IR cameras for 10% of inspections
- Leak repair on appropriate timeframes

There must be much tighter commitments for the measures that are in the proposed ACEPMs, and several measures that are missing need to be added. These include:³²

- Reduction in the pace or phasing of development
- Curtailment of production
- Capture and sale of gas emitted from drilling, completions, production testing, pipeline maintenance, liquids unloading, and oil wells (associated gas)
- Replacement of existing high- or intermittent-bleed pneumatic controllers with low- or no-bleed controllers, and installation of low- or no-bleed controllers in new construction
- Installation of emissions controls on all storage tanks
- Equipment replacement or better maintenance for compressors and dehydrators
- Quarterly inspection of leaks with optical gas imaging and immediate repair

A key area of concern to Conservation Groups is the effectiveness of the mitigation measures adopted to ensure that the methane captured is able to make it to market for sale and not be vented or flared. Such considerations must be included in the agency’s NEPA analysis. This includes, *inter alia*, how the agency will assess whether the gathering and processing investments proposed are adequate. That is, the agency is obligated to identify and describe how the infrastructure investments identified in the EIS (i.e., gathering pipelines, compressor stations and processing facilities) will be located and adequately sized to accommodate estimated levels of production of natural gas for the duration of the proposed project.

³² Waste Prevention, Production Subject to Royalties, and Resource Conservation: Proposed Rule; The Comprehensive Air Resource Protection Protocol, Colorado BLM State Office, September 2013 (updated 2015), and Leaking Profits, Natural Resources Defense Council, March 2012.

Notably, at least one BLM Field Office has already taken pioneering steps to address methane emissions and waste through mandatory mitigation measures at the RMP stage. Specifically, in a joint Land and Resource Management Plan (“LRMP”), BLM: 1610 (CO-933), adopted by BLM Colorado’s Tres Rios Field Office (“TRFO”) and the San Juan National Forest (“SJNF”), the agencies broke new and essential ground in both acknowledging that significant GHG pollution would result from oil and gas development on TRFO lands, and then establishing required methane mitigation standards at the planning stage that will bind future leases and permits to drill to comply with these measures. As provided in the Final EIS for the LRMP:

NEPA analysis is typically conducted for oil and gas leasing and when permits are issued. **This FEIS is the first NEPA analysis where lands that could be made available for lease are identified and stipulated.** In a subsequent analysis stage, when there is a site-specific proposal for development, additional air quality impact analysis would occur. This typically occurs when an application for a permit to drill is submitted. Based on the analysis results, additional mitigation or other equally effective options could be considered to reduce air pollution.

Final EIS at 372 (emphasis added). The TRFO set a new standard by recognizing that the climate change impacts from oil and gas industry activities are cumulative and that methane losses from business-as-usual industry practices at the field office level contribute significantly to climate change and must be mitigated. In the Final EIS, the TRFO also recognized that methane emissions represent waste of a key natural resource that belongs to all U.S. citizens, and the failure to control such waste robs the U.S. and state treasuries of royalty revenues. Accordingly, the TRFO adopted six important methane mitigation measures, which include:

- Centralized Liquid Gathering Systems and Liquid Transport Pipelines
- Reduced Emission Completions/Recompletions (green completions)
- Replacement of High-bleed Pneumatics with Low-Bleed/No-Bleed or Air-Driven Pneumatic Devices on all Existing Wells
- Installation of Low Bleed/No Bleed Pneumatic Devices on all New Wells
- Dehydrator Emissions Controls
- Electric Compression

Id. at 376.

As the VFO proceeds in the Monument Butte planning process, it is essential to consider the pioneering action taken by the TRFO. *See* 40 C.F.R. § 1502.9(c)(1)(ii). The dismissive approach to climate change reflected in the FEIS, and failure to adequately address methane emissions altogether, is plainly incompatible with the climate impacts of oil and gas development. It is incumbent upon the VFO to confront the issues of climate change and methane emissions head-on, which must be accomplished through field office level planning and decisionmaking that is reflective of challenges we face. While we commend the extensive list of mitigation measures included in the ACEPMs, we believe that additional measures should be added and that, as in the case of the TRFO, the VFO should adopt these measures as mandatory COAs for all future drilling approval.

Moreover, and in addition to both national rulemaking and precedent-setting action at the local field office level, BLM’s Colorado State Office has recently adopted its Comprehensive Air Resources Protection Protocol (“CARPP”), which, as provided by the agency:

[D]escribes the process and strategies the BLM will use when authorizing activities that have the potential to adversely impact air quality within the state of Colorado. This protocol also outlines specific measures that may be taken to address BLM-approved activities with the potential to cause significant adverse impacts to air resources ... within any planning area []. Further, the purposes of this protocol are to address air quality issues identified by the [BLM], or public scoping, in its analysis of potential impacts on air resources for BLM Colorado [RMPs] and [EIS’]; and clarify the mechanisms and procedures that BLM will use to achieve the air resources goals, objectives, and management actions set forth in BLM Colorado RMPs.

While the BLM Colorado CARPP is not binding on the Vernal Field Office, it nevertheless provides an important state-of-the-art resource to augment the agency’s analysis of GHG mitigation measures applicable to the Monument Butte MDP. In particular, Table V-I identifies Best Management Practices and Air Emission Reduction Strategies for Oil and Gas Development for criteria pollutants, hazardous pollutants, and methane. The CARPP must be considered by BLM in its decisionmaking regarding the Monument Butte EIS. *See* 40 C.F.R. § 1502.9(c)(1)(ii).

d. The capture of methane is critical due to its global warming potential.

Ensuring compliance with the agency’s methane waste obligations through proper analysis and documentation in the NEPA process is important: technologies and practices change, and the BLM’s duty to prevent degradation and waste cannot be excused just because the agency apparently lags behind the technological curve. The GAO’s 2010 report noted that BLM’s existing waste prevention guidance – Notice to Lessees and Operators (“NTL”) 4a – was developed in 1980, well before many methane reduction technologies and practices were developed and understood. GAO also found that NTL-4a does not “enumerate the sources that should be reported or specify how they should be estimated.”³³ Problematically, GAO noted “that [BLM] thought the industry would use venting and flaring technologies if they made economic sense,” a perspective which assumes – wrongly – that markets work perfectly in the absence of necessary regulatory signals and is belied by the lack of information about the magnitude of methane waste and the documented, if still poorly understood, barriers to the deployment of GHG reduction technologies and practices. *Id.* at 20-33. Compounding the problem, GAO also “found a lack of consistency across BLM field offices regarding their understanding of which intermittent volumes of lost gas should be reported to [the Oil and Gas Operations Report].” *Id.* at 11. BLM, to its credit, conceded: “existing guidance was outdated

³³ *See* GAO-11-34 (2010) at 11, 27 (attached to DEIS comments).

given current technologies and said that they were planning to update it by the second quarter of 2012.” *Id.* at 27.

Indeed, a Report released by NRDC identified that “[c]apturing currently wasted methane for sale could reduce pollution, enhance air quality, improve human health, conserve energy resources, and bring in more than \$2 billion of additional revenue each year.”³⁴ Moreover, the Report further identified ten technically proven, commercially available, and profitable methane emission control technologies that together can capture more than 80 percent of the methane currently going to waste. *Id.* Similar to the practices identified above, such technologies must be considered in BLM’s alternatives analysis, especially since many of them are included as mandatory requirements in the proposed BLM methane waste rule.

Here, BLM’s Monument Butte FEIS identifies ACEPMs, intended to mitigate project emissions, and which identify several mitigation control practices and technologies. *See* FEIS at 2-30 to 2-32. Although such ACEPMs are better than unconstrained development alternatives, as explained above they do not require the type of mandatory control requirements that are warranted, are included in the proposed BLM waste rule, and which have been required by other BLM field offices. Again, for example, the ACEPMs discuss “routing all saleable quality gas to a flow line as soon as practicable . . .” or requiring “electric compression where feasible.” *Id.* (emphasis added). These types of discretionary and undefined requirements are insufficient. Further, several important emissions control measures are simply missing from the ACEPMs and must be added.³⁵

Preventing GHG pollution and waste is particularly important in the natural gas context, where there is an absence of meaningful lifecycle analysis of the GHG pollution emitted by the production, processing, transmission, distribution, and combustion of natural gas. Although natural gas is often touted as a ‘cleaner’ alternative to dirty coal, as noted above, recent evidence indicates that we must first take immediate, common sense action to reduce GHG pollution from natural gas before it can be safely relied on as an effective tool to transition to a clean energy economy (a noted priority of this Administration).³⁶ A recent report by Climate Central addresses

³⁴ Susan Harvey, et al., *Leaking Profits: The U.S. Oil and Gas Industry Can Reduce Pollution, Conserve Resources, and Make Money by Preventing Methane Waste* (March 2012) (attached to DEIS comments).

³⁵ Waste Prevention, Production Subject to Royalties, and Resource Conservation: Proposed Rule; Colorado Department of Public Health and Environment, Oil and Gas Rulemaking Hearing, February 19 thru 23, 2014, Conservation Groups Pre-Hearing Statements, Testimony of David McCabe, at 10-12 (attached to DEIS comments).

³⁶ Robert W. Howarth, *Assessment of the Greenhouse Gas Footprint of Natural Gas from Shale Formations Obtained by High-Volume, Slick-Water Hydraulic Fracturing* (Rev’d. Jan. 26, 2011) (attached to DEIS comments). *See also* Robert W. Howarth et al., *Venting and Leaking of Methane from Shale Gas Development: Response to Cathles et al.* (2012) ((attached to DEIS comments); Eric D. Larson, PhD, Climate Central, *Natural Gas and Climate Change* (May 2013) (attached to DEIS comments).

the leak rates estimated by various sources and the impacts of this new information on assertions that natural gas is a cleaner fuel than coal, ultimately concluding that given the losses from oil and gas sources it would be decades before switching electricity generation from coal to natural gas could bring about significant reductions in emissions.³⁷

Oil and natural gas systems are the biggest contributor to methane emissions in the United States, accounting for over one quarter of all methane emissions.³⁸ In light of serious controversy and uncertainties regarding GHG pollution from oil and gas development, the agencies quantitative assessment should account for methane's long-term (100-year) global warming impact and, also, methane's short-term (20-year) warming impact using the latest peer-reviewed science to ensure that potentially significant impacts are not underestimated or ignored. *See* 40 C.F.R. § 1508.27(a) (requiring consideration of "[b]oth short- and long-term effects").

EPA's GHG Inventory – which BLM has historically relied upon in its analysis – assumes that methane is 21 times as potent as carbon dioxide ("CO₂") over a 100-year time horizon,³⁹ a global warming potential ("GWP") based on the Intergovernmental Panel on Climate Change's ("IPCC") Second Assessment Report from 1996.⁴⁰ However, the IPCC recently updated their 100-year GWP for methane, substantially increasing the heat-trapping effect to 34.⁴¹ A Supplementary Information Report ("SIR"), prepared for BLM's oil and gas leasing program in Montana and the Dakotas, further explains that GWP "provides a method to quantify the cumulative effect of multiple GHGs released into the atmosphere by calculating carbon dioxide equivalent (CO₂e) for the GHGs." SIR at 1-2.⁴² However, substantial questions arise when you calibrate methane's GWP over the 20-year planning and environmental review horizon used in the SIR and, typically, by BLM, including the TRFO/SJNF. *See* SIR at 4-1 thru

³⁷ *See* Larson, attached above as.

³⁸ *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-*(attached to DEIS comments).

³⁹ *See* 78 Fed.Reg. 19802, April 2, 2013 (EPA proposal to increase methane's GWP to 25 times CO₂).

⁴⁰ INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *Second Assessment Report* (1996) (attached to DEIS comments); *see also* U.S. Environmental Protection Agency, *Methane*, available at: <http://www.epa.gov/outreach/scientific.html>.

⁴¹ *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *Working Group I Contribution to the IPCC Fifth Assessment Report Climate Change 2013: The Physical Science Basis*, at 8-58 (Table 8.7) (Sept. 2013) (attached to DEIS comments).

⁴² BLM, *Climate Change, Supplementary Information Report, Montana, North Dakota and South Dakota* (2010) available at: www.blm.gov/mt/st/en/prog/energy/oil_and_gas/leasing/leasingEAs.html (attached to DEIS comments).

4-45 (discussing BLM-derived reasonably foreseeable development potential in each planning area). Over this 20-year time period, the IPCC's new research has calculated that methane's GWP is 87⁴³ – yet another substantial increase from its earlier estimate of 72, which was still over three times as potent as otherwise assumed by the SIR.⁴⁴

However, recent peer-reviewed science demonstrates that gas-aerosol interactions amplify methane's impact such that methane is actually 105 times as potent over a twenty year time period.⁴⁵ This information suggests that the near-term impacts of methane emissions have been significantly underestimated. *See* 40 C.F.R. § 1508.27(a) (requiring consideration of short and long term effects). Further, by extension, BLM has also significantly underestimated the near-term benefits of keeping methane emissions out of the atmosphere. 40 C.F.R. §§ 1502.16(e), (f); *id.* at 1508.27. These estimates are important given the noted importance of near term action to ameliorate climate change – near term action that scientists say should focus, *inter alia*, on preventing the emission of short-lived but potent GHGs like methane while, at the same time, stemming the ongoing increase in the concentration of carbon dioxide.⁴⁶ These uncertainties – which, here, the agencies do not address – necessitate analysis in the Monument Butte DEIS. 40 C.F.R. §§ 1508.27(a), (b)(4)-(5).

Additional, serious, yet unaddressed uncertainties pertain to the magnitude of methane pollution from oil and gas emissions sources. As provided in the most recent EPA Inventory of Emissions and Sinks: 1990-2011, “[f]urther research is needed in some cases to improve the accuracy of emission factors used to calculate emissions from a variety of sources;” specifically citing the lack of accuracy in emission factors applied to methane sources.⁴⁷ A lack of data reliability has resulted in notable variation in methane emissions reporting from year to year. For example, in a Technical Support Document (“TSD”) prepared for EPA’s mandatory GHG reporting rule for the oil and gas sector for 2012, EPA determined that several emissions sources

⁴³ *See IPCC Physical Science Report*, Chapter 8 at 714 Table 8.7 & note b, attached above.

⁴⁴ *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, Fourth Assessment Report, Working Group 1, Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Ch. 2, p. 212, Table 2.14, available at: www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html (attached to DEIS comments).

⁴⁵ Drew Shindell et al., *Improved Attribution of Climate Forcing to Emissions*, SCIENCE 2009 326 (5953), p. 716, available at: www.sciencemag.org/cgi/content/abstract/326/5953/716 (attached to DEIS comments).

⁴⁶ *See, e.g., Limiting Global Warming: Variety of Efforts Needed Ranging from 'Herculean' to the Readily Actionable, Scientists Say*, SCIENCE DAILY (May 4, 2010), available at: <http://www.sciencedaily.com/releases/2010/05/100503161328.htm>; *see also*, Ramanathan, et. al., (attached to DEIS comments).

⁴⁷ *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011*, at 1-19.

were projected to be “significantly underestimated.”⁴⁸ EPA thus provided revised emissions factors for four of the most significant underestimated sources that ranged from ten times higher (for well venting from liquids unloading) to as many as 3,500 and 8,800 times higher (for gas well venting from completions and well workovers of unconventional wells).⁴⁹ When EPA accounted for just these four revisions, it more than doubled the estimated GHG emissions from oil and gas production, from 90.2 million metric tons of CO₂ equivalent (“MMTCO₂e”) to 198.0 MMTCO₂e.⁵⁰ However, these emission estimates are based on an outdated GWP of 21. Using the IPCCs new 100-year GWP for methane of 36, that is 320.5 MMTCO₂e, and, considering a 20-year GWP of 87, that is 792.0 MMTCO₂e – or, respectively, the equivalent emissions from 90.7 or 224 coal fired power plants that is wasted annually. These upward revisions were based primarily on EPA’s choice of data set, here, having replaced Energy Information Administration (“EIA”) data with emissions data from an EPA and Gas Research Institute (“GRI”) study. In the current year, EPA relied on yet another set of data; this time from an oil and gas industry survey of well data conducted by the American Petroleum Institute (“API”) and the American Natural Gas Alliance (“ANGA”).⁵¹ The API/ANGA survey was conducted in response to EPA’s upward adjustments in the previous GHG inventory, noting that “[i]ndustry was alarmed by the upward adjustment,” and focused specifically on emissions from liquids unloading and unconventional gas well completions and workovers.⁵² Overall, the survey found that revising emissions from these two sources alone would reduce EPA oil and gas methane emissions estimates, which resulted in reported oil and gas production emissions at 100 MMTCO₂e pursuant to the EPA’s GHG Reporting Program.⁵³

To provide a specific example of these differing data sets, EPA previously used an emissions factor of 3 thousand standard cubic feet (“Mcf”) of gas emitted to the atmosphere per well completion in calculating its GHG inventory. EPA determined that this figure was significantly underestimated and that a far more accurate emissions factor was 9,175 Mcf per well.⁵⁴ The API/ANGA study suggested that this emission factor is 9,000 Mcf.⁵⁵ However, these

⁴⁸ U.S. Environmental Protection Agency, *Greenhouse Gas Emissions Reporting From The Petroleum And Natural Gas Industry Background Technical Support Document*, at 8, available at: <http://www.epa.gov/climatechange/emissions/subpart/w.html> (attached to DEIS comments).

⁴⁹ *Id.* at 9, Table 1; see also *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011*.

⁵⁰ See EPA, *GHG Emissions Reporting* at 10, Table 2.

⁵¹ *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011*, at 3-63.

⁵² API/ANGA, *Characterizing Pivotal Sources of Methane Emissions from Natural Gas Production: Summary and Analysis of API and ANGA Survey Responses*, Sept. 2012, at 1 (attached to DEIS comments).

⁵³ See EPA, *Petroleum and Natural Gas Systems: 2011 Data Summary (for 2013 GHG Reporting)*, at 3 (attached to DEIS comments).

⁵⁴ See EPA, *GHG Emissions Reporting*, at Appendix B at 84-87.

emissions factors are simply broad, generalized estimates for well emissions across the nation, and can vary significantly from one geologic formation to the next. For example, emissions reported in the Piceance Basin are as high as 22,000 Mcf of gas per well.⁵⁶

Despite this variability in methane pollution data, what remains clear is that inefficiencies and leakage in oil and gas production results in a huge amount of avoidable waste and emissions, and, conversely, a great opportunity for the BLM to reduce GHG emissions on our public lands. Many of these uncertainties and underestimates, as EPA has explained, are a result of the fact that emissions factors were “developed prior to the boom in unconventional well drilling (1992) and in the absence of any field data and does not capture the diversity of well completion and workover operations or the variance in emissions that can be expected from different hydrocarbon reservoirs in the country.” *Mandatory GHG Reporting Rule*, 75 Fed. Reg. 18608, 18621 (April 12, 2010). These underestimates are also caused by the dispersed nature of oil and gas equipment – rather than a single, easily grasped source, such as a coal-fired power plant, oil and gas production consists of large numbers of wells, tanks, compressor stations, pipelines, and other equipment that, individually, may appear insignificant but, cumulatively, may very well be quite significant. While dispersed, oil and gas development is nonetheless a massive, landscape-scale industrial operation – one that just happens to not have a single roof. BLM, as the agency charged with oversight of onshore oil and gas development, therefore has an opportunity to improve our knowledge base regarding GHG emissions from oil and gas production, providing some measure of clarity to this important issue by taking the requisite “hard look” NEPA analysis as part of its decisionmaking for the proposed action.⁵⁷

Convincing evidence also exists to support the consideration of alternatives that would attach meaningful stipulations to areas open to oil and gas development. As a prime contributor to short-term climate change over the next few decades, methane is a prime target for near-term GHG reductions. In fact, there are many proven technologies and practices already available to reduce significantly the methane emissions from oil and gas operations, as mentioned above and further detailed below. These technologies also offer opportunities for significant cost-savings from recovered methane gas. Moreover, new research indicates that tropospheric ozone and black carbon (“BC”) contribute to both degraded air quality and global warming, and that emission control measures can reduce these pollutants using current technology and

⁵⁵ *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011*, at 3-69.

⁵⁶ See, e.g., EPA, Natural Gas STAR Program, *Recommended Technologies and Practices for Wells*, available at: www.epa.gov/gasstar/tools/recommended.html; see also EPA, Natural Gas STAR Program, *Reduced Emissions Completions*, Oct. 26, 2005, at 14 (attached to DEIS comments).

⁵⁷ In this context, the 2010 SIR, while providing a basic literature review of GHG emissions sources, is merely a starting point for BLM’s responsibility to take a hard look at GHG emissions in the context of foreseeable drilling operations in the geologic formations proposed for leasing.

experience.⁵⁸ Employment of these strategies will annually avoid a substantial number of premature deaths from outdoor air pollution, as well as increase annual crop yields by millions of metric tons due to ozone reductions. Indeed, reducing methane emissions is important not only to better protect the climate, but also to prevent waste of the oil and gas resource itself and the potential loss of economic value, including royalties. BLM should evaluate these technologies, analyzing the benefits of technological implementation versus current agency requirements.

These benefits – as well as the proven, cost-effective technologies and practices that achieve these benefits – are documented by EPA’s “Natural Gas STAR” program, which encourages oil and natural gas companies to cut methane waste to reduce climate pollution and recover value and consolidates the lessons learned from industry for the benefit of other companies and entities with oil and gas responsibilities such as BLM.⁵⁹ EPA has identified well over 100 proven technologies and practices to reduce methane waste from wells, tanks, pipelines, valves, pneumatics, and other equipment and thereby make operations more efficient.⁶⁰ Though underutilized, EPA’s Natural Gas STAR suggests the opportunity to dramatically reduce GHG pollution from oil and gas development, *if* its identified technologies and practices were implemented at the proper scale and supported by EPA’s sister agencies, such as BLM. For calendar year 2010, EPA estimated that this program avoided 38.1 million metric tons CO₂ equivalent, and added revenue of nearly \$376 million in natural gas sales (at \$4.00/Mcf) – revenue which translates into additional royalties to federal and state governments for the American public.⁶¹ BLM must consider these emission reduction strategies in its NEPA analysis, both to address impacts of the proposed action, as well as to satisfy the requirements of SO 3226, FLPMA, and the MLA.

⁵⁸ Drew Shindell, et al., *Simultaneously Mitigating Near-Term Climate Change and Improving Human Health and Food Security*, SCIENCE 2012 335, at 183 (attached to DEIS comments).

⁵⁹ See generally, EPA, Natural Gas STAR Program, available at: www.epa.gov/gasstar/.

⁶⁰ See EPA, Natural Gas STAR Program, *Recommended Technologies and Practices*, available at: www.epa.gov/gasstar/tools/recommended.html.

⁶¹ See EPA, Natural Gas STAR Program, *Accomplishments*, available at: www.epa.gov/gasstar/accomplishments/index.html#three (attached to DEIS comments). BLM should also take a look at EPA’s more detailed program accomplishments to provide a measure of what BLM could itself accomplish, and to understand the nature of the problem and opportunities. Also of interest, for calendar year 2008, EPA estimated that its program avoided 46.3 million tons of CO₂ equivalent, equal to the annual GHG emissions from approximately 6 million homes per year, and added revenue of nearly \$802 million in natural gas sales. To speculate, the calendar year 2009 declines are likely associated with ongoing economic and financial stagnation and the low price of natural gas that has slowed natural gas drilling and production.

2. Managing for Community and Ecosystem Resiliency.

Resilience is “an ability to recover from or adjust easily to misfortune or change.” MERRIAM-WEBSTER COLLEGIATE DICTIONARY (11th ed. 2008). In the context of climate change and the many resultant impacts, such as the alteration to the biosphere and impairments to human health, the resiliency of our landscapes and a community’s ability to respond and adapt to these changes takes on a new magnitude of importance.

Beyond mitigating climate change by reducing contributions of GHG pollution to the atmosphere, the BLM can also help promote ecological resiliency and adaptability by reducing external anthropogenic environmental stresses (like oil and gas development) as a way of best positioning public lands and the communities that rely on those public lands to withstand what is acknowledged ongoing and intensifying climate change degradation. It is crucial for the BLM to close the gap in their decisionmaking regarding the cumulative contribution of oil and gas development authorized in the proposed action, particularly given the conflict between such authorization and the agency’s responsibility to manage for healthy, resilient ecosystems. Quite simply, continuing to manage our public lands in a manner that allows for the virtually unabated extraction of mineral resources is incompatible with principals of ecosystem resilience. Agency decisionmaking, both at the leasing stage and in future site-specific implementation, must be reflective of the climate challenges we now face.

The BLM must consider the resilience of our communities and their ability to adapt and respond to climate change in its NEPA analysis. Although not specifically in the context of climate change, Congress has recognized the value that farmlands play in the welfare of people and our communities. *See* 7 U.S.C.A. §§ 4201(a)(1) (“the Nation’s farmland is a unique natural resource and provides food and fiber necessary for the continued welfare of the people of the United States”); (a)(3) (“continued decrease in the Nation’s farmland base may threaten the ability of the United States to produce food and fiber in sufficient quantities to meet domestic needs”); and (a)(5) (“Federal actions, in many cases, result in the conversion of farmland to nonagricultural uses where alternative actions would be preferred”). Any action taken that undermines a community’s welfare and capacity to provide for itself in the face of recognized changes to climate – such as the largely unabated development of oil and gas resources – fails to realize the agency’s multiple use mandate under FLPMA, and, further, is indefensible pursuant to BLM’s mandate to act as stewards of our public lands.

The myriad impacts that will result from the agency’s decisionmaking must be considered within the context of resiliency. Although the BLM may recognize the threat of climate change, the agency’s decisionmaking must also be reflective of this harm and take the many necessary and meaningful steps to ameliorate the impacts to communities, landscapes, and species. As discussed above, climate change is dramatically altering the relationship between human kind and the environment in which we live. It is incumbent on the agency to not only takes steps to stem the pace of climate change through the practical implementation of mitigation technologies but, also, to position communities in a way that allows them to adjust and recover from the climate change impacts that they are already experiencing. Such critical consideration of agency decisionmaking is required if we are to meaningfully respond to the vast scale of impacts that we face.

II. THE FINAL EIS FAILS TO ANALYZE OR ASSESS AIR POLLUTION IMPACTS, INCLUDING GREENHOUSE GAS EMISSIONS, FROM CONNECTED ACTIONS.

Under NEPA, the direct, indirect, and cumulative impacts of connected actions must be analyzed in the same NEPA document. This is to ensure that potentially significant impacts are not overlooked or otherwise minimized when determining whether an action will have a significant impact on the environment. As the Tenth Circuit Court of Appeals has explained: “One of the primary reasons for requiring an agency to evaluate ‘connected actions’ in a single NEPA analysis is to prevent agency from minimizing the potential environmental consequences of a proposed action (and thus short-circuiting NEPA review) by segmenting or isolating an individual action that, by itself, may not have a significant environmental impact.” *Citizens’ Committee to Save our Canyons v. U.S. Forest Service*, 297 F.3d 1012, 1029 (10th Cir. 2002) (citations omitted).

An action is “connected” if it is “closely related” to other actions and is identified based on three factors in NEPA’s implementing regulations. Actions are “connected” if they:

- (i) automatically trigger other actions which may require environmental impact statements.
- (ii) cannot or will not proceed unless other actions are taken previously or simultaneously.
- (iii) are interdependent parts of a larger action and depend on the larger action for their justification.

40 C.F.R. § 1508.25(a)(1). To determine whether actions are connected, the 10th Circuit applies the “independent utility test,” which asks whether “each of the two projects *would* have taken place with or without the other” *Wilderness Workshop v. U.S. Bureau of Land Mgmt.*, 531 F. 3d 1220, 1229 (10th Cir. 2008) (emphasis added) (quoting *Great Basin Mine Watch v. Hankins*, 456 F.3d 955, 969 (9th Cir. 2006).

Here, it appears the BLM failed to appropriately analyze and assess the impacts of several connected actions in terms of their air quality impacts, particularly to national ambient air quality standards (“NAAQS”), and greenhouse gas impacts.

A. The Final EIS Does not Analyze or Assess the Direct and Indirect Impacts of Truck Traffic.

It does not appear that the final EIS fully analyzes or assesses the direct and indirect air quality and greenhouse gas impacts of truck traffic associated with the proposed oil and gas production.

Notably, with regards to air quality, it appears that an analysis and assessment of truck traffic emissions impacts, to the extent it was fully completed, was limited solely to the Monument Buttes Project Area (“MBPA”). Indeed, the Air Quality Technical Support Document (“AQTSD”) indicates that dispersion modeling of emissions was limited to emissions produced

in the project area, not off-site. This is a significant oversight as truck traffic is not limited solely to the project area, but rather occurs throughout the region as trucks are loaded, mobilize, and return as they serve the MBPA. These off-site emissions are clearly connected to the proposed development and must be analyzed and assessed as part of the direct and indirect air quality impacts. To this end, the air quality analysis is flawed because it does not assess how truck traffic will affect air quality outside of the Project Area. For example, as trucks travel to and from Vernal, Utah or other towns in the region, the agency fails to identify how ambient air quality be affected in the areas that they travel. We are particularly concerned because monitoring in Vernal has shown tremendously high pollution levels, including a number of exceedances and near-exceedances of the national ambient air quality standards. Truck traffic in and near Vernal, especially at the scale analyzed by the EIS for the project area (e.g., up to 1.95 million miles annually by 2019, *see* AQTSD), would appear to pose a significant direct strain on air quality outside of the Project Area.

**Highest Recent Pollution Readings for Vernal, Utah Monitoring Site
(ID No. 490471003)⁶²**

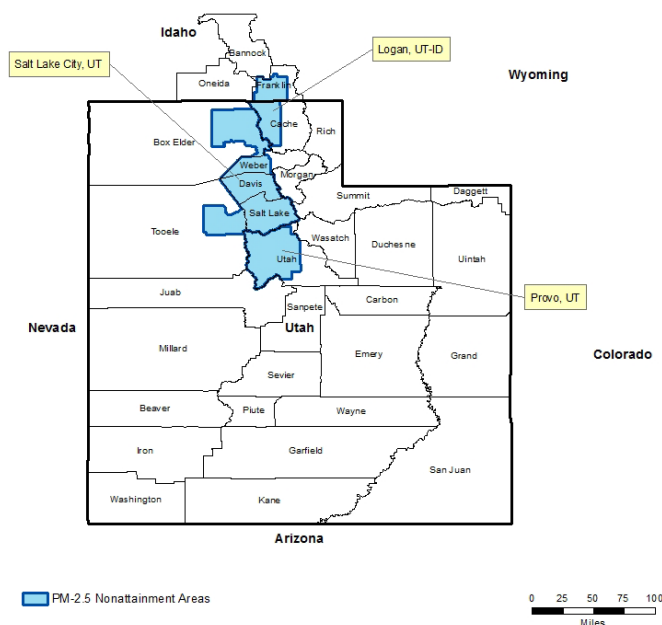
Highest 8-hour Ozone	Highest 1-hour Nitrogen Dioxide	Highest 24-hour PM_{2.5}
0.114 ppm	90 ppb	28.3 micrograms/cubic meter

Similarly, given that the oil produced as part of the proposed action will be trucked to refineries in and near Salt Lake City, the EIS must address the direct and indirect impacts that emissions from these trucks will have to air quality in the Salt Lake City area. This is especially critical given that the Salt Lake City region is currently designated nonattainment for the PM_{2.5} and PM₁₀ NAAQS and regularly exceeds these NAAQS, as well as the ozone NAAQS. *See* Image below showing PM_{2.5} Nonattainment Areas in and near Salt Lake City. Clearly emissions related to the connected action of trucking oil to refineries in and near the Salt Lake City area must be analyzed and assessed given the potentially significant ramifications this has for air quality in the Salt Lake City area.⁶³

⁶² The PM_{2.5} values are from 2012. Monitoring for PM_{2.5} apparently did not occur in 2013.

⁶³ To this end, it would appear that BLM must ensure that the air quality impacts of its decision conform to the Clean Air Act in accordance with 40 C.F.R. § 93. Indeed, if approval of the Monument Buttes project will lead to the release of more than 100 tons of PM_{2.5} or 100 tons of NO_x, then general conformity requirements would apply. The BLM must ensure that its decision fully complies with applicable conformity requirements under the Clean Air Act.

Utah / Idaho PM-2.5 Nonattainment Areas (2006 Standard)



B. The Final EIS Does not Analyze or Assess the Direct and Indirect Impacts of Oil Refining.

The Final EIS is also silent on the air quality and greenhouse gas impacts of oil refining, even though this is clearly an action connected with the proposed oil and gas development. Indeed, the produced oil will need to be refined in order to be a useful product. Although the BLM may assert that refining of oil would take place regardless of whether the proposed action is approved, the fact is that the oil proposed to be drilled for and produced would not be refined if the BLM were to reject the proposed action. In fact, the oil that would otherwise be produced as part of the proposed action would stay in the ground and would never be refined. Thus, refining of the oil proposed for production does not have “independent utility” and therefore the direct and indirect impacts of refining must be addressed, particularly from an air quality standpoint.

While the BLM may assert that it does not know where the oil will be refined, there is sufficient information to indicate the oil will be refined in facilities within or near Salt Lake City, as that is where oil currently produced in the Uinta Basin is refined. Indeed, crude oil produced in the Uinta Basin is limited to being shipped to Salt Lake area refineries given its unique qualities. As a recent notice stated:

Production of crude oil within Duchesne County, Utah has increased from 8.7 Million Barrels (MM BBL) in 2008 to 11.9 MMBBL in 2011. Production in 2012 was nearly 14 MM BBL, and 2013 is on pace for 18 MMBBL. This represents a 54% increase over the last five years. New drilling technology continues to improve the ability for economical extraction of Uinta Basin crude. **The majority of this production is currently transported via tanker truck to Salt Lake City.**

The oil produced from the Uinta Basin is paraffinic crude that is not compatible with the current pipeline infrastructure in Utah. The product must be maintained at an elevated temperature in order to flow through a pipeline. Other pipelines in the area were not designed to maintain the temperatures that Uinta crude requires. Therefore, the Uinta crude is currently loaded into trucks and transported via road to refineries. **The unique composition of the Uinta crude also hinders its transportation to markets outside of the Salt Lake metropolitan area.**

Several refineries in the Salt Lake metropolitan area have announced planned upgrades to increase the capacity to process crude produced in Utah, including the Uinta Basin. These planned upgrades will take advantage of the relatively lower price of locally produced crude. The project provides infrastructure to deliver typically lower priced, locally produced crude oil to market in an environmentally responsible and safe manner.

USDA Forest Service, *Notice of Intent to Prepare an Environmental Impact Statement*, 79 Fed. Reg. 4657-4659 (Jan. 29, 2014) (emphasis added). Clearly it is a near certainty that oil produced in the Monument Buttes area will be shipped to Salt Lake City for refining.

To this end, the BLM must analyze and assess the significance of the air quality and greenhouse gas impacts of refining as direct impacts of the proposed action. The BLM can easily analyze and assess such impacts by relying on EPA greenhouse gas inventory data (*see* Greenhouse Gas Reporting Data for Refineries in Utah in 2012 (attached to DEIS comments), and by relying on emissions calculation methodology from the EPA (*see* EPA, Emission Estimation Protocol for Petroleum Refineries (attached to DEIS comments)).

C. Oil and Gas Combustion Impacts.

The EIS also does not analyze or assess the connected combustion impacts of the produced oil and gas. Given that oil and gas is produced for one primary reason, to be consumed as fuel, the combustion impacts are a connected action and must be analyzed. Here, the EIS does not acknowledge these connected actions.

This oversight is significant, as the potential greenhouse gas emission impacts associated with the combustion of the produced hydrocarbons, including oil, natural gas, and natural gas liquids, appear to be substantial. Using emission factors provided by the EPA, it appears that greenhouse gas emissions may approach 4.8 billion metric tons or more under the proposed action. *See* Table below. This is a staggering amount of greenhouse gas emissions that the EIS does not analyze or assess.

Greenhouse Gas Emissions from Oil, Natural Gas, and Natural Gas Liquids Combustion⁶⁴

Hydrocarbon	Amount	GHG Emission Factor	Total GHGs (metric tons)
Oil	335 Million Barrels of Oil	0.43 metric tons CO ₂ /barrel	144,050,000
Natural Gas	7.4 Trillion Cubic Feet	0.00005361 metric tons/cubic feet	396,714,000
Natural Gas Liquids	10,085 Million Barrels	0.43 metric tons CO ₂ /barrel	4,336,550,000
		TOTAL	4,877,314,000

To be certain, some oil and natural gas liquids may be used for non-fuel purposes. However, even if just half of the potential greenhouse gas emissions associated with oil and gas combustion actually occur, this would represent a significant amount of greenhouse gases that are not disclosed in the EIS. The BLM must disclose the reasonably foreseeable greenhouse gas emissions associated with the proposed development, not remain completely silent on the matter as the EIS currently does.

D. The Final EIS Fails to Address Off-site Trucking and Refining as an Indirect Impact.

At a minimum, the Final EIS must address the impacts of off-site trucking, refining, and greenhouse gas emissions from oil and gas combustion as an indirect impact of the proposed oil and gas development. Under NEPA an indirect impact is one that is “caused by the action and [is] later in time or farther removed in distance, but [is] still reasonably foreseeable.” 40 C.F.R. § 1508.8(b). Clearly off-site trucking, refining, and greenhouse gas emissions from oil and gas combustion are “reasonably foreseeable,” even if the BLM may believe that they are not “connected actions.” Although we believe that the impacts of off-site trucking, refining, and greenhouse gas emissions from oil and gas combustion are connected actions, the EIS must at least analyze and assess these consequences as indirect impacts.

III. BLM’S PROPOSED ACTIONS WILL NOT COMPLY WITH FLPMA.

The BLM has a duty to ensure compliance with federal air quality standards in accordance with the Federal Land Policy and Management Act (“FLPMA”). *See* 43 U.S.C. § 1712(c)(8). Moreover, FLPMA and BLM’s own regulations explicitly provide for protection of air resources. *See* 43 U.S.C. § 1701(a)(8) (stating the public lands shall be “managed in a manner

⁶⁴ Estimated hydrocarbon production is disclosed on page 4-28 of the Final EIS. EPA emission factors are disclosed at <http://www.epa.gov/cleanenergy/energy-resources/refs.html>. According to the EPA’s emission factors, carbon emissions average 0.43 metric tons of carbon dioxide per barrel of oil. We assume that carbon emissions from the combustion of natural gas liquids would be similar. For natural gas, the EPA estimates carbon emissions to average 0.00536 metric tons per therm. One therm of natural gas equals approximately 100 cubic feet, thus carbon emissions would average 0.0000536 metric tons per cubic foot of natural gas combusted.

that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values”).

FLPMA specifically states that BLM land use plans shall, “provide for compliance with applicable pollution control laws, including State and Federal air, water, noise, or other pollution standard or implementation plans.” *Id.* BLM regulations further mandate that “each land use authorization” shall “require compliance with air and water quality standards established pursuant to applicable Federal or State law.” 43 C.F.R. § 2920.7(b)(3). FLPMA’s requirement to ensure compliance with air quality standards is, therefore, mandatory. *Cal. Coastal Comm’n v. Granite Rock Co.*, 480 U.S. 572, 587 (1987).

In this case, however, it does not appear as if the BLM will comply with the air quality mandates of FLPMA and its implementing regulations if it authorizes the Monument Butte oil and gas development as proposed.

To begin, it does not appear that the 2008 Vernal Resource Management Plan (“RMP”) is in compliance with FLPMA. As noted, FLPMA explicitly mandates that land use plans must provide for compliance with applicable federal air quality standards. *See* 43 U.S.C. § 1712(c)(8). Here, it does not appear that the Vernal RMP explicitly provides for compliance with federal air standards. In particular, the Air Quality Management Decisions in the 2008 RMP do not explicitly state that the BLM shall ensure compliance with federal air standards. *See* 2008 RMP at 70. This is of significant concern because it allows the BLM to flout compliance with the NAAQS for ozone and other pollutants. Because the NAAQS are federal air standards, the failure of the RMP to require compliance is contrary to FLPMA.

That the RMP is flawed is evidenced by the fact that the BLM is proposing to approve the Monument Buttes proposal even though the Draft EIS clearly discloses that current ozone concentrations in the Uinta Basin are out of compliance with the ozone NAAQS and even though all reasonable information indicates the proposed development will contribute to these and future violations. In other words, it appears the proposed Monument Butte development will simply make a bad situation worse. The Vernal RMP, in failing to require compliance with federal air quality standards, has emboldened the BLM to dismiss the impacts of the project to the NAAQS.

In addition to the failure of the Vernal RMP to assure compliance with federal air quality standards, it also appears that BLM is violating its project-level obligations to ensure that all land use authorizations comply with federal air quality standards. The Final EIS clearly discloses that under all action alternatives, the ozone problem in the Uinta Basin will be made worse. This is due to the fact that emissions will continue to increase in the project area amidst clear violations of the ozone NAAQS. This can hardly be said to comply with FLPMA’s requirement that the BLM comply with federal air standards in implementing projects.

The BLM may claim that it is only obligated to ensure the operator complies with state and federal air quality regulations, but such a claim violates FLPMA’s plain and unambiguous language, and also appears flatly contrary to the agency’s own regulations. FLPMA and applicable regulations require compliance with federal air quality standards. Although reliance on federal and state air quality regulations may be appropriate where such standards are clearly

protecting the NAAQS, where such standards are not protecting the NAAQS – such as in the Uinta Basin – the BLM has an affirmative and independent duty to protect air standards and ensure compliance with the NAAQS. This duty cannot be ignored simply because the BLM believes protecting air quality is not its job.

IV. BLM MUST REVISE THE EIS AND RE-CONSULT WITH THE FISH AND WILDLIFE SERVICE REGARDING THE PROJECT’S HARMFUL EFFECTS ON THE ENDANGERED FISH.⁶⁵

The Monument Butte project would have significant effects on survival and recovery of the endangered Colorado pikeminnow, razorback sucker, humpback chub, and bonytail (collectively, “endangered fish”). The lower Green River runs along the eastern edge of the Monument Butte project area and contains designated critical habitat for the Colorado pikeminnow and razorback sucker along this river reach and for many miles downstream. *See* Exhibit A-1 (map marking critical habitat). Critical habitat for the humpback chub and bonytail also exists 20 miles downstream from the project area. *Id.*; BA at 157-58. Water depletions from this Colorado River tributary, the increased risk of toxic spills, and sedimentation would undermine conservation and recovery efforts of the fish, but these impacts have not been sufficiently analyzed in the EIS or in BLM and Fish and Wildlife Service’s (Service) section 7 consultation. BLM must revise and recirculate the EIS and re-consult with the Service to address these effects.⁶⁶

A. BLM and the Service Must Reinitiate Consultation Regarding the Project’s Water Depletion Effects on the Endangered Fish.

As BLM’s Biological Assessment (“BA”) for the project recognizes, “[a]ny water depletions from tributary waters within the Colorado River drainage are considered to ‘jeopardize the continued existence’ of [the endangered] fish under [the endangered fish] Recovery Program.” BA at 86. Therefore, any depletion is subject to section 7 consultation. BLM and the Service rely on a number of previous consultations regarding Newfield’s existing water rights and their depletion effects on the endangered fish, but these consultations are severely outdated, failing to take into account a great deal of new information that has emerged since the Service issued its biological opinions in 2005, 2006, 2011, and 2012. Specifically, new information about (1) climate change effects on stream flows (which is not even acknowledged in these prior consultations), (2) long-term drought and increased water demand which has drastically reduced water supplies, and (3) declining razorback sucker and Colorado pikeminnow populations, reveal effects of the action that may affect the species in a manner or to an extent not previously considered, and therefore trigger reinitiation of consultation.

⁶⁵ All references and exhibits cited in this section are being provided on a CD and will be delivered to BLM’s office shortly.

⁶⁶ As BLM’s Biological Assessment and EIS rely on the same impacts analysis on the endangered fish, the following comments apply to both BLM’s analysis under NEPA, as well as under the ESA.

The EIS projects that, at its peak, the Monument Butte project would deplete a total of 3,924 acre-feet per year, or an annual average of 2,774 acre-feet per year. The biological opinion for the project concludes that because Newfield intends to rely on existing water rights that BLM and the Service have already consulted over, the agencies need not re-consult over the project's water depletion effects.⁶⁷ These prior consultations cover:

(1) Castle Peak Eightmile Flat Oil and Gas Expansion Project ("Castle Peak"), including the Green River Collector Well, with a projected depletion of 2,081 acre-feet of water from the Colorado River System per year (2005);

(2) Amendment to Castle Peak Eightmile Flat ("Castle Peak Amendment"), which increased the projected water use of the Castle Peak project by 819 acre-feet to 2,900 acre-feet per year (2006);

(3) Newfield Production's 20-Acre Infill Development Project ("20-Acre Infill"), which falls within the project area of the Monument Butte project, with a projected depletion of 428 acre-feet per year (2011); and

(4) Newfield Exploration Company and Ute Energy, LLC's proposed Rocky Point Exploration and Development ("Rocky Point") (2012), which relies on the same water rights consulted over in Castle Peak Eightmile Flat, but increases it to 2,823 acre-feet per year (2,081 acre-feet from Castle Peak (omitting the 2006 revision) + 917 acre-feet).

(5) A historic depletion of 324 acre-feet per year, which was included in the Service's 1993 consultation for the Recovery Implementation Program for the Endangered Fish Species in the Colorado River Basin.

The above depletions total 4,569 acre-feet per year, and according to the BiOp, are already authorized through section 7 consultations (including the historic depletion of 324 acre-feet per year). At the time the consultations for the 20-Acre Infill and Rocky Point water depletions were completed, BLM and the Service anticipated future reliance on these depletions and their associated BiOps for development of the Monument Butte project.⁶⁸ Accordingly, the BiOp for Monument Butte concludes that none of these existing water rights need undergo further consultation.

⁶⁷ According to BLM, the BA's statement that a certain portion of this total has not been consulted over is incorrect (Tel. Comm. between Wendy Park, CBD and Stephanie Howard, BLM on or about Aug. 2, 2016).

⁶⁸ See 20-Acre Infill BO at 7 ("This depletion (428 acre-feet) will carryover for future Newfield oil and gas related development for the life of the proposed Newfield Greater Monument Butte oil and gas development which is anticipated to be 30 years after project approval."); Rocky Point BO at 5 ("While not part of the Rocky Point Proposed Action, Newfield, the BIA, and the Service have agreed to use this EA/BA as "the mechanism for the programmatic section 7 consultation on additional water depletion for the waterflood program for the life of the Greater Monument Butte Development (approximately 20 to 30 years).")

However, the last substantive analysis of depletion impacts on the endangered fish from any of Newfield's water rights was performed over a decade ago in 2005, in the Castle Peak BiOp. No subsequent consultation updates the effects analysis of the original 2,081 acre-feet per year that the Service and BLM consulted over in 2005. These later consultations only consist of pro forma reviews, which find that monetary payment to the Recovery Program would offset depletion effects on the endangered fish, without up-to-date analysis of baseline environmental conditions, the current status of the fish, existing threats to the fishes' survival, and depletion effects on the fish in the context of current environmental conditions and the species' status.

Since 2005, significant new information about (1) climate change effects on Colorado River Basin stream flows and the endangered fish, (2) increasingly reduced water supply, and (3) declining Colorado pikeminnow and humpback chub numbers has emerged, requiring BLM and the Service to reinitiate consultation on Newfield's existing water rights and their depletion effects.

1. Climate Change Is Reducing Stream Flows in the Colorado River Basin

None of the consultation documents that the Monument Butte project relies on discuss climate change effects on reducing Colorado River Basin stream flows and how such reductions could impact the endangered fish. Anthropogenic climate change is profoundly impacting the Colorado River in ways that are altering temperature, streamflow, and the hydrologic cycle. As detailed below, changes observed to date include rising temperatures, earlier snowmelt and streamflow, decreasing snowpack, and declining runoff and streamflow. Modeling studies project that these changes will only worsen, including continued declines in streamflow and intensification of drought. Climate change is likely to have significant effects on the endangered fish species in the Colorado River basin and the Colorado River ecosystem.

Rising temperatures

The Colorado River basin has warmed significantly during the past century, with average increases in surface temperature of 1.6°F (0.9°C) over the Southwest during 1901-2010 (Hoerling et al. 2013). The greatest warming has occurred in spring and summer, and in daytime high temperatures and nighttime low temperatures (Bonfils et al. 2008, Hoerling et al. 2013). Surface temperatures in the Southwest are projected to increase steeply in this century by an average of 4.5 to 7.9° F depending on the emissions scenario, with an average of 2.5 to 3°F of warming projected for 2021-2050 alone (Cayan et al. 2013). As explained below, warming temperatures are having significant effects on streamflow, drought severity, and the hydrologic cycle in the Southwest (Barnett et al. 2008, Woodhouse et al. 2016).

Earlier snowmelt and streamflow

In much of the Colorado River basin, snowmelt, snowmelt runoff, and streamflow timing have trended earlier since the mid-1950s, in parallel with warming temperatures (Hamlet et al. 2005, Stewart et al. 2005, Barnett et al. 2008, Hoerling et al. 2013, Garfin et al. 2014). The Colorado River basin's spring pulse from 1978-2004 shifted to two weeks earlier compared to

flows before 1978 (Ray et al. 2008). Although there are both natural and human influences on these hydrologic trends, studies indicate that anthropogenic greenhouse gases began to impact snow-fed streamflow timing during 1950-1999 (Barnett et al. 2008, Hidalgo et al. 2009, Hoerling et al. 2013). Modeling studies have projected that snowmelt, spring runoff, and streamflow timing will continue to shift earlier across much of the Southwest (Stewart et al. 2004, Rauscher et al. 2008, Dettinger et al. 2015).

Decreasing snowpack

The Colorado River receives most of its water from winter snowpack from the Rocky Mountains, where 15% of the total basin areas generates 85% of the river flow (Dettinger et al. 2015). Across much of the Colorado River basin, the spring snowpack is decreasing and more winter precipitation is falling as rain instead of snow (Hamlet et al. 2005, Pierce et al. 2008, Das et al. 2009). Approximately half of the observed decline in snowpack in the western United States during 1950-1999 has been attributed to the effects of anthropogenic greenhouse gases, ozone and aerosols (Pierce et al. 2008). Modeling studies project a continued reduction of Southwest mountain snowpack during February through May during this century, largely due to the effects of rising temperatures (Cayan et al. 2013, Dettinger et al. 2015).

Declining Runoff and Streamflow

Annual runoff in the Colorado River basin appears to be declining (USBR 2011), with significant consequences for reduced streamflow. During 2001–2010, warm temperatures and dry conditions reduced average naturalized flows in the Colorado River (measured at Lees Ferry) to the second-lowest-flow decade since 1901, to 12.6 million acre-feet per year compared to the 1901–2000 average of 15.0 million acre-feet per year (Hoerling et al. 2013).

Modeling studies project that runoff and streamflow will continue to decrease substantially in the Colorado River basin during this century (Ray et al. 2008, Das et al. 2011, USBR 2011, Cayan et al. 2013, Georgakakos et al. 2014, Dettinger et al. 2015). Barnett and Pierce (2009) concluded that anthropogenic climate change is likely to reduce runoff in the Colorado River basin by 10-30% by 2050. Projected reductions in runoff range from 6-7% (Christensen and Lettenmaier 2007) to 45% (Hoerling and Eischeid 2007) depending on the models and methods used in each study (see Barnett and Pierce 2009 at Table 2). In the short term, Hoerling and Eischeid (2007) predict streamflow to decrease by 25% during 2006-2030, and by 45% during 2035-2060.

Importantly, numerous studies show that warming temperatures alone will cause runoff and streamflow declines in the Colorado River basin. For example, in a recent review, Vano et al. (2014) estimated that future streamflow in the Colorado River basin will be reduced by 5% to 35% due to rising temperature alone. When precipitation change is considered, a 5% decrease in precipitation would further reduce streamflow by 10% to 15% (Vano et al. 2014).

Moreover, warming temperatures will play an increasingly important role in causing runoff to decline in the Colorado River basin, and must be factored into streamflow forecasts (Woodhouse et al. 2016). An empirical study of the influence of precipitation, temperature, and

soil moisture on upper Colorado River basin streamflow over the past century found that warmer temperatures have already resulted in flows less than expected based on precipitation levels (Woodhouse et al. 2016). Consistent with past research, the study found that cool season precipitation explains most of the variability in annual streamflow. However, temperature was highly influential in determining streamflow under certain conditions. The study concluded that “[s]ince 1988, a marked increase in the frequency of warm years with lower flows than expected, given precipitation, suggests continued warming temperatures will be an increasingly important influence in reducing future UCRB water supplies.” The researchers warned that “streamflow forecasts run the risk of overprediction if warming spring and early summer temperatures are not adequately considered.”

According to the study’s press release it is the “first to examine the instrumental historical record to see if a temperature effect [on stream flows] could be detected.”⁶⁹ The study’s lead author highlighted its significance: “If we have a warmer spring, we can anticipate that the flows will be less relative to the amount of snowpack[.]...What we’re seeing is not just the future – it’s actually now. That’s not something I say lightly.”⁷⁰

Increasing Drought Severity

Historically, droughts in the Colorado River basin were primarily driven by precipitation deficits. However, studies indicate that rising temperatures have begun to play a more important role in driving droughts (Hoerling et al. 2013, Vano et al. 2014). Importantly, rising temperature superimposed on natural drought variability is expected to exacerbate the impacts of droughts (Seager et al. 2012, Cook et al. 2015). Modeling studies project that droughts in Southwest will intensify due to longer periods of dry weather and more extreme heat, leading to higher evapotranspiration and moisture loss (Seager et al. 2007, Cayan et al. 2010, Trenberth et al. 2013). In the Colorado River basin, future droughts are projected to be substantially hotter, and drought is projected to become more frequent, intense, and longer lasting than in the historical record (Garfin et al. 2014).

Reduced reservoir levels and unsustainable demand for water

Of the more than 90 reservoirs on the river and its tributaries, the two largest are Lake Mead and Lake Powell which together can store up to 85% of the total flow for the basin combined (Christensen et al. 2004). Reservoirs in the Colorado River basin are highly vulnerable to climate change, particularly because the amount of storage in reservoirs is sensitive to runoff changes (Barnett and Pierce 2008). Even small decreases in runoff have caused average reservoir levels to markedly decrease (Christensen et al. 2004). Christensen et al. (2004) predicted that climate change impacts on the hydrology of the Colorado River system would result in water demand (deliveries and evaporation) exceeding reservoir inflows (which would also be decreased), resulting in a degraded system. Likewise, Barnett and Pierce (2008) projected that a

⁶⁹ American Geophysical Union, Colorado River Flows Reduced by Warmer Spring Temperatures (March 9, 2016), available at <http://news.agu.org/press-release/colorado-river-flows-reduced-by-warmer-spring-temperatures/>.

⁷⁰ *Id.*

10% reduction in runoff would result in requested water deliveries surpassing sustainable deliveries by 2040, while a 20% reduction in runoff would cause unsustainable water demands by 2025. A greater demand than supply makes the system more prone to long-term sustained droughts, as reservoirs will not have sufficient time to be naturally replenished and more water will be extracted from a dwindling supply than is sustainable (Christensen and Lettenmaier 2007). Reservoirs would spend additional time in a depleted state, weakening the system's buffering ability in years where there is low precipitation (Barnett and Pierce 2009).

In addition to reducing the overall amount of water in the Upper Colorado River Basin, these climate change effects would worsen effects from toxic spills (discussed in more detail below) by increasing the concentration of pollutants and toxic contaminants. Climate change is also likely to exacerbate mercury pollution effects on the Colorado pikeminnow. Mercury deposited into soil from coal burning will increasingly run off into streams with increased heavy rainfall events.⁷¹ More frequent and severe wildfire events will result in increased charring of soil, releasing mercury that can wash off into streams.⁷² Warmer water conditions will hasten the conversion of mercury into toxic methylmercury.⁷³

Ample evidence, including empirical research, demonstrates that climate change is already reducing stream flows in the Colorado River Basin and that flows will continue to dwindle as Colorado Basin temperatures rise. BLM and the Service must reinstate consultation over Newfield's water rights and take into account these climate change effects on the endangered fish, in connection with its evaluation of the proposed Monument Butte project's water depletion effects.

2. Persistent Drought Conditions and Increasing Water Demand Have Reduced Water Supply

Compounding this threat to the endangered fish are persistent drought conditions that have diminished natural flows in the Colorado River Basin and reduced water storage that is needed to supplement Upper Basin flows. The period from 2000 to 2015 was the lowest 16-year period for natural flow in the last century, and one of the lowest 16-year periods for natural flow in the past 1,200 years, according to paleorecords.⁷⁴ As a result, water storage in the Colorado River system reservoirs have declined "from nearly full to about half of capacity," and led to local shortages in the Upper Colorado's sub-basins.⁷⁵

⁷¹ National Wildlife Federation, *Swimming Upstream: Freshwater Fish in a Warming World*, 19 (2013), available at <http://www.nwf.org/~media/PDFs/Global-Warming/Reports/NWF-Swimming%20Upstream-082813-B.ashx>.

⁷² *Id.*

⁷³ *Id.*

⁷⁴ Bureau of Reclamation, *Managing Water in the West: SECURE Water Act Section 9503(c) Report to Congress*, Chapter 3, Colorado River Basin at 3-64 (2016).

⁷⁵ *Id.*

Further, population growth will increase water demand for agriculture and municipal uses, making it increasingly difficult to ensure sufficient water availability for the endangered fish, which rely on the release of stored water, especially in dry years.⁷⁶ An ever widening gap between water supply and water demand is weakening the Colorado River water supply system's reliability and ability to buffer the system in dry years.⁷⁷ According to the U.S. Geological Survey, "increased water demand and declining water availability make the restoration of endangered fish habitat extremely challenging."⁷⁸ This growing gap between supply and demand in the Upper Colorado River Basin must be taken into account in a reinitiated consultation.

3. Population Numbers of the Endangered Fish Are Declining

Colorado pikeminnow populations are in decline throughout the Green River and Colorado River Basin, indicating that the Recovery Plan for the endangered fish has not been effective and that the impacts of water depletions may be more severe than previously anticipated.

According to the Fish and Wildlife Service, the latest 2014 Colorado River sub-basin population number of 501 is "cause for great concern," and catch of sub-adults and adults in 2013 and 2014 "were near lowest observed in the history of the project."⁷⁹ 2015 catch numbers are within the same range, which suggests that the population estimate for 2015 will be similar to the 2014 estimate.⁸⁰ Preliminary data show that the Green River sub-population is "in decline throughout the entire Green River Subbasin" and has fallen under 2,000, below the minimum viable population of 2,600 adults.⁸¹ The Yampa River portion of the sub-basin population also "remains low and may be in further decline."⁸² Recent studies show that Colorado pikeminnow declines in the Yampa River are linked to "persistent high densities of nonnative predators (e.g., smallmouth bass and northern pike [])," and that northern pike are outnumbering Colorado pikeminnow by three to one.⁸³ The weakening of the Yampa River portion of the sub-basin population makes it even more critical to ensure that habitat for the Green River portion of the Green River sub-basin population is not degraded and remains a stronghold for the species.

⁷⁶ *See id.* at 3-7, 3-8.

⁷⁷ *Id.* at 3-10, 3-12.

⁷⁸ USGS, Effects of Climate Change and Land Use on Water Resources in the Upper Colorado River Basin, 5 (2010), available at <https://pubs.usgs.gov/fs/2010/3123/pdf/FS10-3123.pdf>.

⁷⁹ USFWS 2015 Sufficient Progress Memo at 23, 36 (Oct. 7, 2015) ("Sufficient Progress Memo") (noting average monthly flows significantly below 810 cfs in 15-mile reach in 2012 and 2013), available at.

⁸⁰ *See* USFWS, Monitoring the Colorado Pikeminnow Population in the Mainstem Colorado River via Periodic Population Estimates, p. 3 (Nov. 2015), available at <http://www.coloradoriverrecovery.org/documents-publications/work-plan-documents/arpts/2015/rsch/127.pdf> (showing similar capture rates of pikeminnow in 2014 and 2015).

⁸¹ Sufficient Progress Memo at 7.

⁸² *Id.*

⁸³ *Id.* at 8.

Humpback chub numbers are also low. Fish and Wildlife Service is “concerned that wild populations of humpback chub in Black Rocks and Westwater Canyon of the Colorado River (near the Colorado-Utah state line) have not recovered from declines detected in the late 1990’s. The reason for those population declines is uncertain.”⁸⁴ After this steep reduction, the Black Rocks/Westwater population continued to decline.⁸⁵ In 2008, the population “dropped below the population size downlist criterion (MVP = 2,100 adults) for the first time.”⁸⁶ In 2011 and 2012, the core population estimates were 1,846 and 1,718, respectively.⁸⁷

The Desolation/Gray Canyons population—which inhabits the Green River directly downstream of the project area—has also not met the population-size downlist criterion, and was observed to be “trending downward” based on 2006-2007 population estimates.⁸⁸ This trend has been attributed to “increased nonnative fish abundance and habitat changes associated with dry weather and low river flows.”⁸⁹ The project’s water depletions within the Green River sub-basin, in connection with climate change effects and shrinking water supply, could exacerbate these declines. The 2014 estimate is 1,863 adults, substantially below the 2,100-adults recovery criterion.⁹⁰

These declining numbers not only show that the endangered fish may be more sensitive to water depletion and other oil and gas development effects than previously assumed, but they strongly suggest that the Endangered Fish Recovery Program is not achieving recovery targets nor adequately offsetting water depletion effects as intended.

B. BLM and the Service’s Consultation over the Project’s Spills Effects is Inadequate.

BLM’s initial determination that the project “may affect, is likely to adversely affect” the endangered fish is based exclusively on the project’s “projected water depletions and the increase in [sediment] yields of the Green River.” BA at 88. This determination was later revised to “not likely to adversely affect.” BO at 3. Implicit in these determinations is BLM’s finding that the increased risk of spills and leaks from oil and gas development near the Green River are not significant enough to support a “likely to adversely affect” finding. The Service’s biological opinion concurs in BLM’s findings. BLM’s analysis in support of these determinations, however, rests on faulty reasoning and disregards a number of factors that could increase spill risks for the endangered fish and their critical habitat.

The risk of spills and leaks contaminating and degrading endangered fish critical habitat would certainly increase with the addition of thousands of new oil and gas wells near the Green River, which contains some of the most conducive habitat for endangered fish conservation and

⁸⁴ *Id.* at 36.

⁸⁵ *Id.* at 13.

⁸⁶ *Id.*

⁸⁷ *Id.* at 13-14.

⁸⁸ *Id.* at 12.

⁸⁹ *Id.* at 23.

⁹⁰ *Id.* at 12.

recovery, including the only known spawning bar for razorback sucker in the Upper Colorado River Basin.⁹¹ Contamination of surface and groundwater from oil and gas activities commonly occurs within the Upper Basin. Between January 2008 and July 2014, operators reported at least 135 spills or leaks that resulted in releases to surface or groundwater in the Upper Basin – many of these from facilities under BLM’s jurisdiction.⁹² 27 of these incidents occurred within the Utah portion of the Upper Basin. Further, since July 2014, 18 spills and leaks that resulted in the contamination of surface water, groundwater, dry drainages, irrigation canals, or stockwater ponds have occurred in Duchesne and Uintah Counties.⁹³ Some of these spills have involved the movement of contaminants over a mile from the point of their initial release.⁹⁴ The contamination of the Green River and its tributaries from oil and gas activities is therefore real and not hypothetical.

The potential for spills to move from tributaries into endangered fish critical habitat within main-stem rivers was shown by a 2014 spill into the Green River. On the night of May 20, 2014 an oil well operated by SW Energy on lands administered by BLM “blew out,” leaking an estimated 100 barrels per hour of crude oil and production water into Salt Wash which leads to the Green River. SW Energy did not shut-in the well until 1:20 p.m. on May 22, at least 36 hours later. On May 24, flooding from a thunderstorm “overcame prevention measures” washing an unknown quantity of oil and produced water 1.5 miles from Salt Wash into the Green River and critical habitat for endangered fish.⁹⁵ The U.S. Fish and Wildlife Service’s recent Biological Opinion for the Gasco Energy Inc. Field Development Project anticipates these events and the potential for more frequent spills given expanded drilling:

There is a greater potential for impacts from pollutants, if a pipeline, well pit, or other source were to inadvertently release contaminated fluids into waterways at points near the Green and White Rivers. Through direct or indirect discharge, these pollutants could reach the Green River and negatively impact water quality to the point of affecting native fish populations. Direct impacts will result from a discharge from a pipeline or well pit reaching the Green River in its original form or within a single release event. Indirect effects occur when discharges are released to the ground and are later released to the river after being carried by an erosion event or carried by rain or snowmelt runoff. As more well and pipeline development occurs in the project area the chance of pollutants reaching the

⁹¹ Valdez, R.A. and P. Nelson. 2004. Green River Subbasin Floodplain Management Plan. Upper Colorado River Endangered Fish Recovery Program, Project Number C-6, Denver, CO., available at <http://www.coloradoriverrecovery.org/documents-publications/technical-reports/hab/GreenFMP.pdf>.

⁹² Spills Data (all Upper Basin tab) (Exhibit A-3); *see also* Spill Incident Reports (2008-July 2014) (Exhibit A-4).

⁹³ *See* Spill Incident Reports (July 2014-present) (Exhibit A-5).

⁹⁴ *See* Spill Incident Reports.

⁹⁵ BLM. 2014. Update: Salt Wash Oil Spill, available at <http://www.blm.gov/ut/st/en/fo/moab/SaltWashSpill.html>.

Green River increases, thus increasing the potential of harm to native fish populations.⁹⁶

The BA admits as much, stating that “spills occurring in close proximity to the Green River, or in streams with flow rates that would deliver condensate to the Green River prior to evaporation, would pose a risk of exposing Colorado River fish to potentially lethal levels of toxic substances.” BA at 88. But in spite of this statement and declining populations of endangered fish in the Green River, which could be severely crippled by a single catastrophic event, it dismisses these potential impacts, presumably on the grounds that mitigation measures would reduce these effects, and that the risk of spills from pipelines would be “low.” It would only take one spill within the project’s 30-year lifespan to detrimentally harm the endangered fish. Given the frequency of spills and the anticipated life of the project, this cursory reasoning does not support BLM’s or the Service’s conclusion that the risk of spills is not likely to adversely affect the endangered fish.

In addition, the BA disregards a number of factors that could increase the risk of harm to the fish. The BA states that the project’s “overall worst case scenario” would be the spill of a 400 barrel condensate tank within the 100-year floodplain of the Green River. BA at 88. But this statement ignores the potential for a blowout which could result in a much larger spill, as discussed above with the Salt Wash incident. The EIS and BA should address the potential for a catastrophic blowout, which could have devastating effects on critical habitat even if not occurring within the 100-year floodplain.

It is also possible that large volumes of chemical substances escape undetected until reaching surface sediments or waters, but the BA does not address such hazards, which could result in chronic sub-lethal effects. The Gasco Biological Opinion explains that this is especially possible with smaller leaks:

The effects of smaller leaks that may cause chronic, sub-lethal effects to fish populations may be more prevalent. While the oil and gas industry has a wide variety of methods available to detect substantial leaks or integrity breaches, the technology for detection of small “pinhole” leaks is not as advanced. This creates a significant problem in that the current available methodology may allow small leaks to go undetected for extended periods of time often evading detection until they are manifested on the surface sediments or water.⁹⁷

Chronic sub-lethal effects from crude oil spills are also discounted in the BA. The BA notes that “[b]ecause the crude oil extracted within the MBPA is solid within the temperature range of the area’s climate, oil would not pose a risk of acute toxicity for Colorado River endangered fish in the event of an accidental spill.” BA at 88. This statement disregards long-

⁹⁶ Fish and Wildlife Service, Biological Opinion for the Gasco Energy Inc. Field Development Project (“Gasco BO”), Dec. 2011, p. 26, available at http://www.blm.gov/style/medialib/blm/ut/vernal_fo/planning/gasco_eis/gasco_rod.Par.56176.File.dat/Gasco%20ROD%20Attachment%205%20BO.pdf.

⁹⁷ Gasco BO, p. 27.

term, sub-lethal effects of crude oil pollution that could cause developmental abnormalities. Specifically, fish embryos chronically exposed to low-levels of crude oil from the Exxon Valdez oil spill in Prince William Sound in Alaska have exhibited heart defects, reducing their swimming ability, growth rates, resistance to disease, and overall ability to survive.⁹⁸ If other organisms feed on crude that sinks to the bottom or that is not fully removed, crude oil toxins could bioaccumulate in predatory fish, including the endangered fish.⁹⁹

The potential for leaks and spills of produced water is also ignored, as the BA's exclusive focus is on condensate and crude oil spills. Produced waters are essentially highly saline waters that rise to the surface from deep underground after completion of a well, and must be disposed. Many recent spills in the Upper Basin (including those involving operator Newfield) involve spillage of produced water. If spilled, the effects of produced water or brine can be more severe and longer-lasting than oil spills, because salts do not biodegrade or break down over time. The only way to deal with them is to remove them.¹⁰⁰ Increased levels of total dissolved solids in surface waters are associated with higher rates of fish mortality.¹⁰¹ Further, produced waters can contain copper, iron, lead, manganese, arsenic, cadmium, nickel, zinc, chromium, selenium, and sodium bicarbonate at levels above thresholds that are harmful to aquatic organisms, including fish.¹⁰² The BA also makes no mention of the potential for truck accidents which may result in the spillage of large volumes of produced waters, wastewaters, fracking fluids, or other chemicals which may be transported to or from the project site.

In addition, a great deal of oil and gas activity is already presently occurring in this area, *see* FEIS Figure 5.1-1, but the BA fails to discuss baseline environmental conditions regarding the existing risk of spills from all past and present projects, as well as any foreseeable risks of spills from state and private future projects, and how the Monument Butte project could cumulatively contribute to degradation of critical habitat and overall risk to the endangered fish.

⁹⁸ Northwest Fisheries Science Center, Delayed effects of oil spill compromise long-term fish survival (Sept. 8, 2015), available at https://www.nwfsc.noaa.gov/news/features/delayed_effects_oilspill/index.cfm; Icardona, John P. et al. Very Low Embryonic Crude Oil Exposures Cause Lasting Cardiac Defects in Salmon and Herring, *Nature Scientific Reports* 5:13499 (Sept. 8, 2015), DOI: 10.1038/srep13499; *see also* Peterson, Charles H, Long-term Ecosystem Response to the Exxon Valdez Oil Spill, *Science* vol. 302, pp. 2082-2086 (Dec. 19, 2003).

⁹⁹ Committee on the Effects of Diluted Bitumen on the Environment, Board on Chemical Sciences and Technology; Division on Earth and Life Studies; National Academies of Sciences, Engineering, and Medicine, *Spills of Diluted Bitumen from Pipelines: A Comparative Study of Environmental Fate, Effects, and Response*, available at <http://www.nap.edu/21834>.

¹⁰⁰ King, Pamela, Limited study supports findings on bigger brine spill risks, *E&E News* (Nov. 4, 2015).

¹⁰¹ Tuckwiller, Ross, *Annotated Bibliography: Potential Impacts of Energy Development on Fisheries in the Rocky Mountain West Prepared for Theodore Roosevelt Conservation Partnership Fish, Wildlife, & Energy Working Group* at 17, available at http://www.trcp.org/documents/ANNOTATED_BIB.pdf.

¹⁰² *Id.* at 21-22 (extremely elevated chromium concentrations in fish exposed to produced waters), p. 23 (fish showing lesions and kidney damage after exposure to sodium bicarbonate).

Maximum setbacks of 500 feet are also too low to avoid contamination risks. *See* FEIS-2, Att. 2 at 51-52 (describing setback distances to protect water resources). Moreover, according to BLM’s analysis of oil and gas spills in Colorado, spills can travel as far as 1,800 feet before contaminating surface water.¹⁰³

Finally, the FEIS notes that “[t]he risk of a spill from pipelines is considered to be low because proposed mitigation measures described in Section 4.10.2.3 would preclude the development of wells in the floodplain.” FEIS 4-128. But even if wells are outside the floodplain, pipelines would traverse at least 953 stream crossings. The FEIS and the BA fail to explain how mitigation measure of siting wells outside the floodplain would mitigate spills from pipelines located directly in the streams at nearly 1000 places.

The existing record does not support a “may affect, not likely to adversely affect,” finding on the endangered fish. BLM and the Service must formally consult over the risk of spills and leaks from oil and gas activities on the endangered fish.

C. BLM and the Service Must Formally Consult Regarding the Project’s Sedimentation Impacts on the Endangered Fish.

BLM’s BA initially determined that the proposed action was “likely to adversely affect” the endangered fish, in part based on potential sedimentation that could impact the endangered fishes’ critical habitat in the Green River. Specifically, the BA found:

Implementation of the Proposed Action could also degrade USFWS-designated critical habitat for Colorado River fish in the Green River by increasing erosion and sediment yield. Sediment deposition may bury and suffocate fish eggs and larvae affecting spawning and rearing, while reduced visibility created by sediment load may inhibit the ability of fish to see prey, impacting feeding behavior (USEPA 2003). Physiological impacts, such as gill clogging and the ingestion of large quantities of sediment, could also cause illness, reduced growth, and eventual death (USEPA 2003). Due to existing surface disturbance, ongoing projects, and poor reclamation success of previously disturbed areas within the MBPA and surrounding region, increased erosion and subsequent sediment yield are likely to occur within these watersheds.

Sediment could be delivered to several perennial streams, riparian habitats, and small, ephemeral drainages (i.e., Castle Peak Draw, Wells Draw, Big Wash, Sheep Wash) within the MBPA. Conservatively assuming that all sediment delivered to Pariette Draw and other drainages within the MBPA is eventually transported to the Green River, the Proposed Action would increase sediment loading to the Green River by about 62 tons annually, or by 0.001 percent in the short-term.

BA at 87. The BA concludes that “[b]ased on the projected water depletions and the increase in [sediment] yields of the Green River, implementation of Alternative D *may affect, is likely to*

¹⁰³ BLM, Grand Junction Resource Management Plan Final EIS at 6-271 (2015).

adversely affect the listed Colorado River fish species...and their habitat. The loss or ‘take’ of an unknown number of individual fish would be anticipated.” *Id.* at 88.

In September 2015, however, BLM revised its section 7 determination to “may affect, not likely to adversely affect,” without explaining its rationale as to why these sedimentation effects would no longer be “likely to affect” the endangered fish. *See* Exhibit A-2 (Sept. 2, 2015 e-mail from BLM to Service). In an email to the Service, BLM explained its revised determination was “[b]ased on [the Service’s] recommendation, and in consideration of the applicant committed and BLM committed mitigation measures, as well as the small size of the impact in critical habitat.” *Id.* An accompanying memo described additional measures incorporated into the proposed project. All of the measures geared towards reducing sedimentation impacts, however, are exclusively aimed at restoration of the fishes’ critical habitat in the Green River’s 100-year floodplain and do not address upstream sedimentation sources that the above passage from the BA identified as being problematic (e.g., sedimentation of the Pariette Draw). Further, even if restoration of disturbed critical habitat is intended to reduce sedimentation yield overall, the record does not support that such measures would be effective, in light of BLM’s observation of “poor reclamation success” for “previously disturbed areas within the MBPA and surrounding region.” BA at 87.

BLM’s unexplained change in its effects determination and the Service’s concurrence lack any rational support. BLM and the Service must formally consult over the effects of sedimentation on the endangered fish’s critical habitat.

V. BLM MUST REVISE THE EIS AND RE-CONSULT WITH THE FISH AND WILDLIFE SERVICE REGARDING THE PROJECT’S HARMFUL EFFECTS ON THREATENED AND SENSITIVE PLANTS

The Monument Butte project will have devastating impacts to the remaining habitat and population of multiple threatened and BLM-sensitive plant species, including Uinta Basin hookless cactus (*Sclerocactus wetlandicus*) (threatened), Pariette cactus (*Sclerocactus brevispinus*) (threatened, warranted for listing as endangered), and sterile yucca (*Yucca sterilis*) (sensitive). Because the FEIS and BA omit significant information regarding the effects on these species, BLM must revise the FEIS and BA and Re-Consult with the Service in order to meet its obligations under Section 7 of the Endangered Species Act and its own Sensitive Species Policy. Although Alternative D and the 2015 Conservation and Mitigation Strategy indicate an awareness of the severe threat to the two threatened cacti from the Monument Butte project, they are inadequate to address the foreseeable impacts to those species and rely on uncertain and/or unproven assumptions regarding the certainty and efficacy of mitigation measures.

A. BLM and the Service Must Reinitiate Consultation Regarding the Project’s Effects on the Survival and Recovery of Listed Cacti

The BLM’s analysis of effects to the two listed cactus species, *S. wetlandicus* and *S. brevispinus*, is founded on a fundamental error of fact and science – the erroneous assumption that both species have identical habitat and life cycle requirements. This error is fundamental to the FEIS and BA’s assumptions regarding impacts to listed cacti, and requires correction and re-consultation. At its heart, the assumption that mitigation of impacts to the Pariette wetlands

ACEC will necessarily protect *S. brevispinus* is in error, because the two species have different occurrence patterns and habitat needs. The narrow band of Pariette wetlands within the Area of Critical Environmental Concern provides protection only for the draw itself and a very narrow adjoining riparian corridor. This ACEC only somewhat protects *S. wetlandicus*, and benefits *S. brevispinus* only to a very narrow degree. As the Service found in its listing decision for *S. brevispinus*, its habitat needs and occurrence pattern differ from those of *S. wetlandicus*:

Sclerocactus brevispinus habitat is a sparsely vegetated desert shrubland dominated by *Atriplex*, *Chrysothamnus*, and *Tetradymia* species (USFWS 1990,p. 7). The species' life history is poorly known, but it is thought to be a longlived perennial usually flowering after 3 or 4 years. A broad assemblage of native bees, and possibly other insects including ants and beetles, pollinates *S. brevispinus* (USFWS 1990, p. 7). *Sclerocactus brevispinus* grows on fine soils in clay badlands derived from the Uinta formation (USFWS 1990, p. 7). The species is restricted to one population in an area about 16 kilometers (km) (10 miles (mi)) long by 8 km (5 mi) wide astride the Duchesne-Uintah County boundary on Bureau of Land Management (BLM), Ute Tribe, State of Utah, and private land.¹⁰⁴

The Center for Native Ecosystems and the Utah Native Society have previously petitioned the BLM to consider designation of an expanded Area of Critical Environmental Concern that would be more effective in protecting habitat for both *S. wetlandicus* and *S. brevispinus*, including areas outside the immediate drainage.¹⁰⁵

Center for Native Ecosystems and Utah Native Plant Society hereby nominate for ACEC designation all known occurrences (including all occurrences discovered prior to the adoption of the final Vernal RMP) of Pariette cactus that are outside the current boundaries of the Pariette Wetlands ACEC, plus buffers of at least 300' (or the distance recommended by Dr. Vince Tepedino, if larger). We suggest that the BLM could accomplish this by either expanding the existing Pariette Wetlands ACEC or by designation of one or more new ACECs.

Under its FLPMA obligation to give priority to the designation of ACECs, BLM must avoid actions, such as the proposed Monument Butte project, that would impair its ability to meet its ACEC obligation. BLM should refrain from allowing any additional surface disturbance within the pollinator buffer of both *S. wetlandicus* and *S. brevispinus* until it has considered and met its ACEC obligations with regard to the 2006 nomination.

The FEIS and BA's analysis of listed cactus impacts is furthermore additionally erroneous due to the unfounded assumption that 300-foot buffers around plant occurrences will

¹⁰⁴ U.S. Fish and Wildlife Service, 12-month finding on a petition to list *Sclerocactus brevispinus* (Pariette cactus) as an Endangered or Threatened Species (Sept. 18, 2007), 72 Fed. Reg. 53,211, 53,213.

¹⁰⁵ See Supplemental Comments of Center for Native Ecosystems, The Wilderness Society, and Utah Native Plant Society on the Vernal Resource Management Plan 4-5 (Feb. 10, 2006), Exhibit A-6.

be sufficient to mitigate impacts (including dust, erosion, and, importantly, pollinator loss) from oil and gas development. The Service’s Biological Opinion acknowledges that the cacti’s pollinators “can travel from 0.4 to 1 kilometer (km) between plants (Tepedino pers. Comm. 17 November 2010). . . Limiting the amount of fragmentation and disturbance within the habitats of *Sclerocactus* is important to maintain adequate pollinator habitats and health cactus populations.”¹⁰⁶ Yet the proposed action and Conservation and Mitigation Strategy are founded on a mere 300 foot buffer for *Sclerocactus* plants and populations. See FEIS 4-165, Conservation and Mitigation Strategy 1. The assumption that a 300-foot buffer will alleviate impacts to the plants’ survival ignores the uncontested opinion of Dr. Tepedino that the plants are dependent on pollinators with a flying range of 400-1000 meters, and require a buffer distance of at least 1 mile.¹⁰⁷

The FEIS and Biological Assessment’s conclusions that the project, despite disturbing some approximately 16,000 acres of habitat (with a substantially larger indirect footprint) will not jeopardize the continued existence of the two cacti is founded in large part on monetary contributions to a *Sclerocactus* Mitigation Fund. See FEIS at 4-167 to 4-169. The “amount is based on an estimate for the cost to grow and transplant a cactus to the wild.” FEIS at 4-167. These assumption, however, are unsupported by evidence that (a) suitable and protected habitat for transplanted cacti exists, (b) transplantation can be successful, or that (c) available habitat and likelihood of success will contribute to the survival and recovery of the species, despite the acknowledged certainty of unmitigatable habitat loss from the project, FEIS at 4-170.

Finally, the FEIS and BA also fail to take into account significant new information regarding effects of ground-level ozone and climate change on the listed cacti and their pollinators.¹⁰⁸ As a result of these errors and omissions, BLM must revise the FEIS to incorporate accurate information and analysis regarding the effects on listed cacti, and must re-initiate consultation with the Fish and Wildlife Service under ESA Section 7 and prepare a corrected Biological Assessment.

B. BLM Must Revise the FEIS to Address Impacts to Sensitive Species

Pursuant to BLM Manual 6840, it is the responsibility of State Directors to not only inventory BLM lands to determine the occurrence of BLM special status species, but also to determine “the condition of the populations and their habitats, and how discretionary BLM actions affect those species and their habitats.”¹⁰⁹ BLM Manual 6840 at .06 provides that “Bureau sensitive species will be managed consistent with species and habitat management objectives in land use and implementation plans to promote their conservation and to minimize the likelihood and need for listing under the ESA.” The FEIS and proposed action fail to

¹⁰⁶ U.S. Fish and Wildlife Service, Final Biological Opinion for the Newfield Exploitation Corporation Greater Natural Butte 5750 Well Project 4-5 (Sept. 4, 2015), FEIS Appendix J.

¹⁰⁷ See FEIS Appendix J at J-16 (1.5 km is “1.5 km (the minimum buffer distance recommended by Tepedino)

¹⁰⁸ See Comments of the Center for Biological Diversity on the 5-Year Status Reviews for Upper Colorado River Basin Species 3-6 (July 26, 2016), Exhibit A-7.

¹⁰⁹ *Id.* at § .04.

adequately analyze the effects on sensitive species, or to minimize the likelihood and need for listing under the ESA.

The FEIS acknowledges the presence of a sensitive species, the sterile yucca: “There is a moderate potential that suitable habitat for this species exists within MBPA based on the vegetation, soil, and elevation associations required by the species. Potential threats to this species include habitat loss and fragmentation as a result of oil and gas development, mineral and building material development, road development, OHV travel, and grazing.” FEIS at 3-64, D-4. The FEIS further acknowledges, under Alternative D, that approximately 1212 acres of potential habitat for the sterile yucca would be impacted. FEIS at 4-161. The FEIS acknowledges significant potential for harm to the species: “As with the Uinta Basin hookless cactus, Barneby’s catseye, and Graham’s catseye, implementation of the Proposed Action could also increase the potential for indirect and dispersed direct effects to this species, if present. Disturbances from construction could increase the potential for the limited invasion and establishment of noxious weed species. Furthermore, these disturbances could potentially increase wind erosion of disturbed areas, which creates airborne dust that could be transported into suitable habitat for this species.” FEIS at 4-139; *see also* FEIS at 4-161. Moreover, the FEIS concedes that “[t]he amount of surface disturbance to potential habitat for Barneby’s catseye, Graham’s catseye, and sterile yucca within the CIAA is currently unknown.” FEIS at 5-34. Without knowing the locations of remaining sterile yucca occurrences, the amount of remaining habitat, the effects of loss of 1213 acres to the project, and the reliability of the proposed mitigation measures, BLM’s conclusion that the project “***is not likely to result in a trend towards federal listing of the species***,” FEIS 4-161, is arbitrary and unsupported. Review of the projected project locations suggests that at least one known occurrence of *Y. sterilis* occurs along a road that would be affected by heavy vehicle traffic. The FEIS fails to map or disclose species occurrences, or to conduct any analysis whatsoever of the effects of vehicle traffic and resulting dust, erosion, and human disturbance on the survival of individual populations or the overall trend for the species and its habitat. These omissions not only violate BLM’s obligations under NEPA to consider environmental impacts, but also its obligations under Manual 6840 to determine the condition of sensitive species and “minimize the likelihood and need for listing under the ESA.”

VI. CONCLUSION

The Conservation Groups appreciate your consideration of the information and concerns addressed herein, as well as the information included in the attached exhibits. This information is critical and must be included in the final analysis for the Monument Butte Oil and Gas Development Project and EIS.

Should you have any questions or wish to discuss our concerns in greater detail, please do not hesitate to contact us.

Sincerely,

A handwritten signature in black ink, appearing to be 'J. H. T.', written in a cursive style.

Kyle Tisdel
Laura King
Tom Singer
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Along with:

Jeremy Nichols
WILDEARTH GUARDIANS

Steve Bloch
SOUTHERN UTAH WILDERNESS ALLIANCE

Michael Saul
Wendy Park
CENTER FOR BIOLOGICAL DIVERSITY

Elly Benson
SIERRA CLUB

Tony Frates
UTAH NATIVE PLANTS SOCIETY

From: Mellon, Cassie
To: [Jeri Krueger](#)
Cc: [Krissy Wilson](#); [Kevin Wheeler](#); [Eric Reid](#); [Justin Jimenez](#)
Subject: Re: FW: Antelope Spring Pics and Contacts for Hydrologist and USFS
Date: Monday, August 22, 2016 3:06:56 PM
Attachments: [HOUSERODRPS.PDF](#)

Hi Jeri,

Both sites on BLM are in the House Range Resource Area. The management plan is attached. They are both also in the Swasey Mountain Wilderness Study Area which was established in 1992. Antelope Springs is in the Antelope grazing allotment, Red Cedar Spring is in the Tatow allotment. Both are allotments are mentioned in the RMP. The main place I'm seeing riparian and spring related management information in the RMP is under the Wildlife and Watershed section.

Let me know if there's anything else you need.

Cassie

On Mon, Aug 22, 2016 at 11:11 AM, Jeri Krueger <jeri.krueger@fws.gov> wrote:

Hi Cassie and Jim,

As a followup to our field trip to bifid duct springsnail sites in Utah on August 9 and 10, I am looking for copies of the BLM's and USFS's land use plans that guide management for the two respective agencies in the areas where bifid duct pyrg occurs. What would be most helpful is if you could either send me a pdf of the land use plan, or a link to a website where I can download it. Also, it would be very helpful if you could let me know what sections of your plans to focus on that would describe the management for each of the bifid duct pyrg locations that provides benefits to the habitat (for instance in the case of BLM, where the WSAs are located and how they are managed, or point me to the sections that describe management of riparian or spring areas, if that exists in your plan).

It was nice seeing you again Cassie, and Jim sorry we didn't have a chance to meet during our visit to Utah.

Thanks for your help, and let me know if you have any questions on my requests.

Regards,

Jeri

v *v* *v* *v* *v* *v* *v* *v* *v* *v*

Jeri Krueger, HCP Coordinator

U.S. Fish and Wildlife Service

Reno Fish and Wildlife Office

1340 Financial Boulevard, Suite 234

Reno, Nevada 89502

O: 775.861.6300; F: 775.861.6301

Jeri_Krueger@fws.gov

v *v* *v* *v* *v* *v* *v* *v* *v* *v*

"One touch of nature makes the whole world kin." - William Shakespeare

From: Kevin Wheeler [mailto:kevinwheeler@utah.gov]

Sent: Monday, August 22, 2016 7:53 AM

To: Krissy Wilson; Jeri Krueger

Subject: Re: Antelope Spring Pics and Contacts for Hydrologist and USFS

The folks that I've coordinated with from Fishlake National Forest are the biologists. They should either know the land use plans enough to help, or recommend someone who might know better. They are:

Jim Whelan (aquatic biologist): jwhelan@fs.fed.us

Sean Kelly skelly02@fs.fed.us

On Mon, Aug 22, 2016 at 8:46 AM, Krissy Wilson <krissywilson@utah.gov> wrote:

can you provide Jeri with the names and emails of the FS folks who were planning to meet us on the site visits last week?

----- Forwarded message -----

From: **Jeri Krueger** <jeri_krueger@fws.gov>

Date: Fri, Aug 19, 2016 at 11:03 AM
Subject: Antelope Spring Pics and Contacts for Hydrologist and USFS
To: krissywilson@utah.gov

Hi Krissy,

When you have a chance, could you forward me some pics of Antelope Spring? That's the only spring I did not get any pics of.

Also, could you forward me some potential contacts for hydrologists (people who can help me determine the water source of the Utah springs) and USFS (to track down a copy of their land use plan for the Fish Lake National Forest)?

Thanks a bunch, and have a great weekend!

Jer

v *v* *v* *v* *v* *v* *v* *v* *v* *v*

Jeri Krueger, HCP Coordinator

U.S. Fish and Wildlife Service

Reno Fish and Wildlife Office

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Jeri_Krueger@fws.gov

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"One touch of nature makes the whole world kin." - William Shakespeare

--

Krissy Wilson
Native Aquatic Species Program Coordinator
Utah Division Wildlife Resources
1594 West North Temple, Suite 2110
Salt Lake City, UT 84114
office phone: [801-538-4756](tel:801-538-4756)

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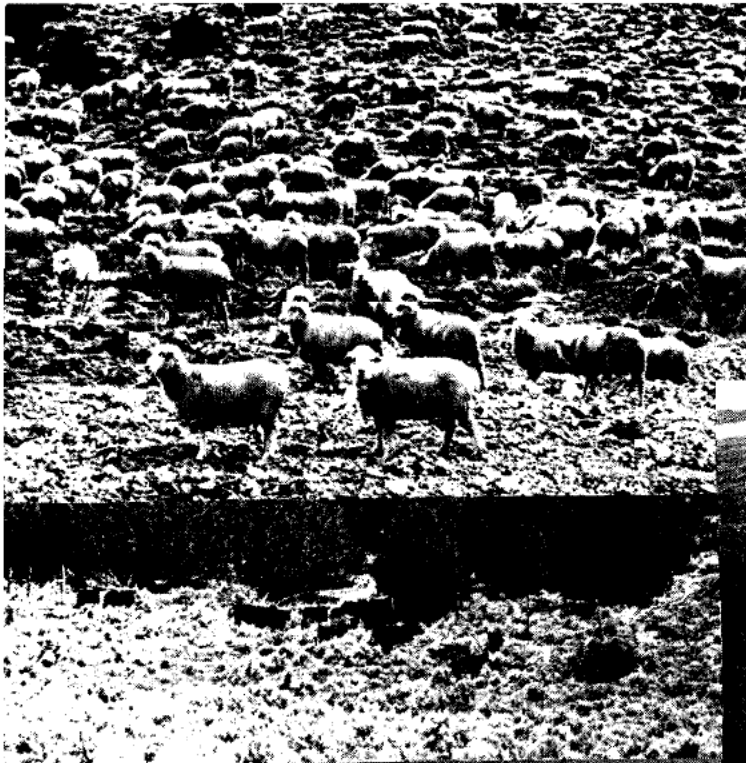
Kevin Wheeler
Native Aquatics Biologist
Utah Division of Wildlife Resources
Washington County Field Office
451 North SR 318
Hurricane, UT 84737
Phone: [435-879-8694](tel:435-879-8694)
Fax: [435-879-8743](tel:435-879-8743)

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Cassie Mellon
Aquatic Ecologist
BLM West Desert District
2370 Decker Lake Boulevard
West Valley City, UT 84119

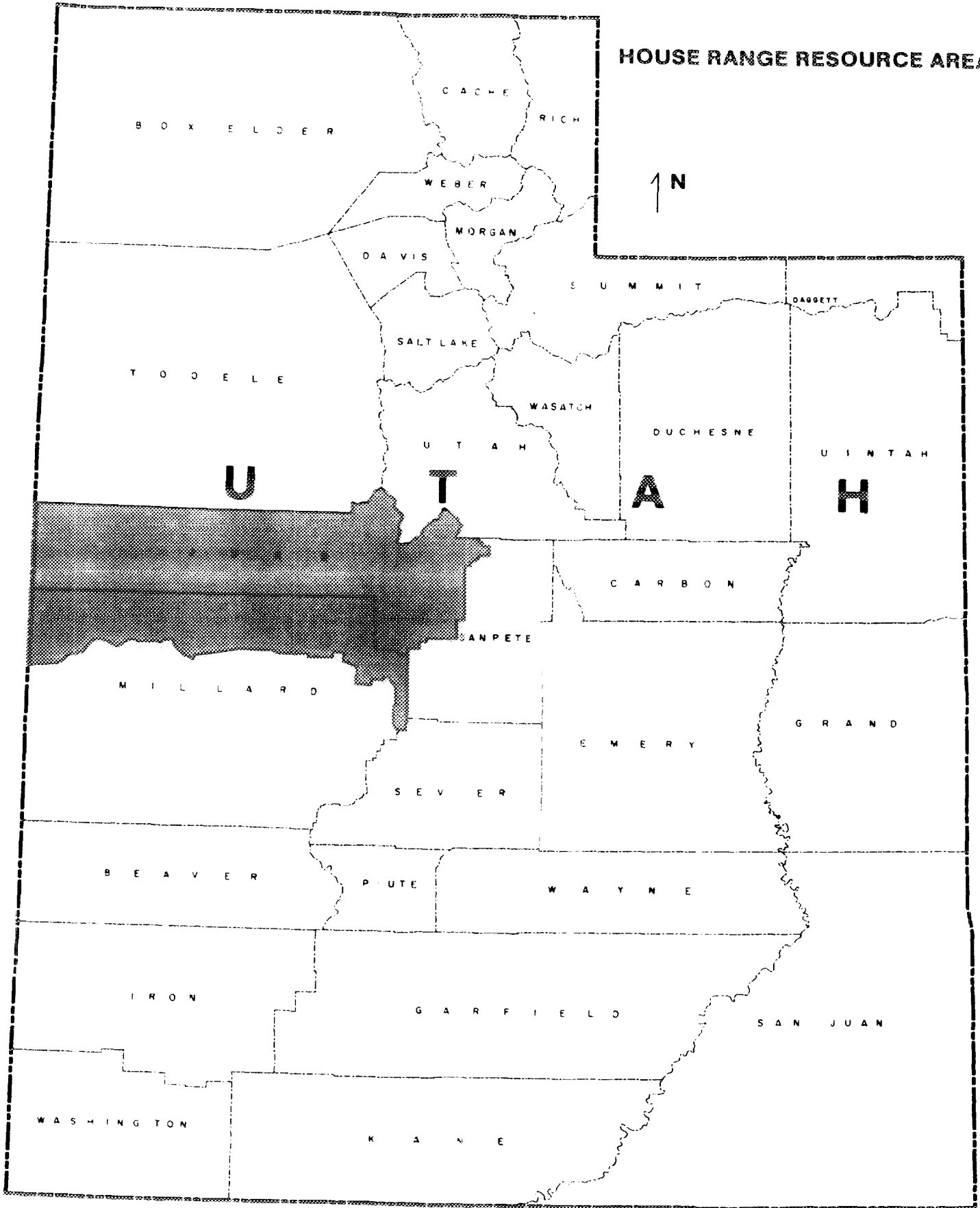
801-977-4378

House Range
Resource Area
Resource Management Plan
And
Record of Decision
Rangeland Program Summary
October 1987



**RICHFIELD DISTRICT
BUREAU OF LAND MANAGEMENT
DEPARTMENT OF THE INTERIOR**

HOUSE RANGE RESOURCE AREA



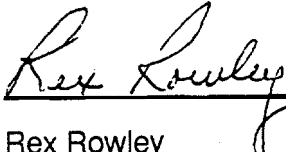
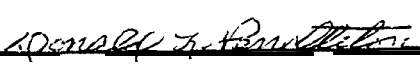
House Range Resource Area

The Resource Management Plan And Record of Decision Rangeland Program Summary


October 1987

RICHFIELD DISTRICT
BUREAU OF LAND MANAGEMENT
DEPARTMENT OF THE INTERIOR

Adoption of the House Range Resource Area Resource Management Plan as provided herein is recommended.

	<u>10-22-87</u>		<u>10/23/87</u>
Rex Rowley	Date	Donald Pendleton	Date
Area Manager		District Manager	
House Range Resource Area		Richfield District	

Adoption of the House Range Resource Area Resource Management Plan as provided herein is approved.

	<u>10/28/87</u>
Roland Robison	Date
Utah State Director	

READERS GUIDE

Chapter 1 briefly describes the resource area, the evolution of the Resource Management Plan (RMP) selected through the planning process, and the alternative plans analyzed in the Draft RMP/Environmental Impact Statement (EIS) for the House Range Resource Area (HRRRA), Millard and Juab Counties, Utah. For additional information on the planning process, planning issues, management concerns, and planning criteria, see Chapter 1 of the Draft RMP/EIS, which was published and distributed in March 1986.

The RMP in Chapter 2 presents the decisions for future management of public land resources in the HRRRA. It is based on Alternative D, The Preferred Alternative. It has been presented in the Draft RMP/EIS and proposed in the Final RMP/EIS. These discussions were expanded to include information required by Federal regulation and Bureau of Land Management (BLM) policy and presented as the proposed RMP in the Final EIS.

Resource or program goals and objectives, proposed actions (including need for subsequent detailed site-specific activity plans), support requirements, implementation sequences or priority, and follow up monitoring and evaluation intervals and standards are included in this document.

All resource maps are located in the inside back cover.



LIST OF ABBREVIATIONS

ACEC: Area of Critical Environmental Concern
AMP: Allotment Management Plan
APD: Application for Permit to Drill
APHIS: Animal and Plant Health Inspection Service
ATV: All Terrain Vehicle
AUM: Animal Unit Month
AWP: Annual Work Plan
BLM: Bureau of Land Management
CCC: Civilian Conservation Corps
CFR: Code of Federal Regulations
CMA: Cooperative Management Agreement
C&MU: Classification and Multiple Use Act
EA: Environmental Assessment
EIS: Environmental Impact Statement
EPA: Environmental Protection Agency
FLPMA: Federal Land Policy and Management Act
FWS: U.S. Fish and Wildlife Service
HMA: Herd Management Area
HMAP: Herd Management Area Plan
HMP: Habitat Management Plan
HRRRA: House Range Resource Area
IM: Instruction Memo
IMP: Interim Management Policy
IPP: Intermountain Power Project
KGRA: Known Geothermal Resource Area
KGS: Known Geologic Structure
LR: Land Report
MFP: Management Framework Plan
MOU: Memorandum of Understanding
NEPA: National Environmental Policy Act
NOI: Notice of Intent
NORA: Notice of Realty Action
NRHP: National Register of Historic Places
ONA: Outstanding Natural Area
ORV: Off-Road Vehicle
PL: Public Law
RMP: Resource Management Plan
ROD: Record of Decision
R&PP: Recreation and Public Purposes Act
RPS: Rangeland Program Summary
SCS: Soil Conservation Service
SRMA: Special Recreation Management Area
T&E: Threatened and Endangered
USDI: United States Department of the Interior
VRM: Visual Resource Management
WO: Washington Office
WSA: Wilderness Study Area

**HOUSE RANGE RESOURCE AREA
RESOURCE MANAGEMENT PLAN
RECORD OF DECISION/RANGELAND PROGRAM SUMMARY
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CHAPTER 1

INTRODUCTION

ORGANIZATION OF THE RESOURCE MANAGEMENT PLAN/RECORD OF DECISION

The decisions presented in Chapter 2 form the Resource Management Plan (RMP) for the House Range Resource Area (HRRA). The Range Management section constitutes the Rangeland Program Summary (RPS) for the HRRA.

The RMP meets requirements of the Federal Land Policy and Management Act (FLPMA) and the court ordered evaluation of livestock grazing on public lands within the HRRA. The court order required examination of the effects of livestock grazing on public land administered by BLM. FLPMA requires an interdisciplinary approach and public involvement in planning and decision making on multiple resource management of public lands.

THE RESOURCE AREA

The HRRA consists of more than 2,245,000 acres of public land administered by BLM (See Table I-1). The area is semi-arid, with an annual rainfall of about eight to ten inches in the valleys and up to 20 inches in the Deep Creek Mountains. Major vegetation includes salt desert shrubs, sagebrush, pinyon-juniper woodlands, and native/seeded grasslands. Wildlife species found in the area include mule deer, antelope, elk, bighorn sheep, chukars, sage grouse, and raptors.

TABLE 1-1
House Range Resource Area Acreages

	Acres	Percent of Total
Public/ELM Administered	2,245,314	69.9
Private	591,346	17.3
State of Utah	300,529	6.6
Utah Division of Wildlife Resources	10,106	0.3
Other Federal		
Forest Service	209,997	6.2
Fish and Wildlife Service	17,992	0.5
Fish Springs Refuge		
Goshute Indian Reservation	32,221	0.9
Total	3,407,505	

All of the resource area, and the western one-third of Utah lies in the Great Basin physiographic province. This topographic region is not a single basin, but consists of block-faulted mountains and intermountain basins in approximately equal portions. The landforms consist of an arid desert lowland without external drainage and north-south trending and isolated mountain ranges. The mountains are short ranges, rising abruptly to heights of 3,000 to 5,000 feet above the surrounding desert floor. Over 150 mountain ranges are found throughout the Basin and Range province; 20 of which extend into, or lie within, the resource area. Many intermountain basins exhibit internal drainage where runoff collects into depressed valley basins and eventually evaporates from desert playas.

Most population centers in the HRRA are scattered along the eastern perimeter of the planning unit along U.S. Highways 6 and Interstate (I) 15, near the foothills of the Pavant Mountains. The small farming settlements of Callao, Trout Creek, Partoun, and Gandy, connected by a county road in the western portions of the resource area, are exceptions to this locational pattern. The Goshute Indian Reservation is located in the northwest corner of the resource area.

CHAPTER 1: INTRODUCTION

The prevailing character of the region has been historically rural in nature, with agriculture playing a key role in economic development. However, in recent years, agriculture's importance has significantly declined. A wide range of support sectors produce a variety of goods and services that contribute to the area's economy. They include banking services, convenience goods, agriculture products, beryllium, gypsum, lava rock, and lime.

THE PLANNING PROCESS

The HRRRA RMP:

1. Updates and revises the previous Management Framework Plan (MFP). Preparation of the RMP, in accordance with BLM policy, was judged preferable to amendment of the MFP.
2. Completes a court-mandated grazing EIS for the HRRRA. It was judged preferable to make the EIS part of this RMP rather than do a separate document.

Following public scoping for management alternatives, the environmental consequences of four alternative management plans were analyzed in the Draft RMP/EIS. That document was published in March, 1986 and distributed for public review and comment. The proposed RMP was then selected and presented in the Proposed RMP Final EIS which was published in September 1986.

The notice of availability of the Proposed RMP/Final EIS (published in the Federal Register by the Environmental Protection Agency [EPA]) was followed by a 30-day public comment and protest period. There were two letters of comment on the Proposed RMP/Final EIS; however, no protests were filed with the Director. The approved plan is published in this ROD/RPS.

Following implementation, resource information will be gathered to assess progress toward the goals and objectives established in the RMP. Standards for monitoring and evaluation include periodic review (at least every five years) to determine if amendment or revision of the RMP is necessary.

For a detailed discussion of the affected environment and environmental consequences of the proposed Plan and alternatives, the reader is referred to the draft and final RMP/EIS.

Plan amendments will be used to allow proposals or actions not in conformance with the plan. Amendment procedures will conform to provisions and requirements defined in BLM planning regulations and policies.

It is anticipated that the plan will remain in effect for at least 20 years. Revisions will occur when management determines that maintenance and amendments are inadequate to adapt to changing circumstances, resource conditions, or policies.

No decisions or recommendations regarding wilderness designation of any of the four Wilderness Study Areas (WSAs) in the HRRRA have been made in the plan. Wilderness designation recommendations have been analyzed in the Utah BLM Statewide Wilderness Draft EIS (January 1986). Until Congress decides on designation or non-designation of the WSAs in the resource area, these areas will be managed in conformance with the BLM's Interim Management Policy (IMP). Designation of any of the four WSAs will constitute an amendment to the RMP. Areas designated will then be managed in accordance with the BLM's Wilderness Management Policy and provisions of the implementing legislation.

PLAN IMPLEMENTATION

Within 90 days of plan approval, the resource area and district staffs will conduct and present to the State Director a management review. That review will identify any on-going operations and activities that require adjustment to conform to the RMP. If any activity requires adjustment, a schedule and action plan for making necessary management adjustments to licenses, permits, contracts, etc., will be included. Existing activity plans will also be reviewed to insure conformance with the RMP.

CHAPTER 1: INTRODUCTION

CONFORMANCE DETERMINATIONS

The basis for determining the conformance of proposed actions are the decisions, terms, stated conditions, associated prescriptions, and plan elements specified in the RMP. A proposed action is nonconforming if it changes resource uses, levels, or areas of production or use approved in the plan. Likewise, actions that would change management constraints, authorized practices, resource conditions, goals or objectives, or the priorities to meet those objectives would be non-conforming.

If a proposed action is found to be nonconforming, it may be disallowed. However, if it warrants further consideration, a plan amendment (in accordance with the National Environmental Policy Act [NEPA] and other applicable guidelines) may be initiated.

Following implementation, plan maintenance will be required to keep the plan current. New information will be posted, analysis refined, and minor changes or corrections made on a timely basis. Maintenance will not, however, expand the level or scope of resource uses; change restrictions; or alter decisions, conditions, or terms defined in the RMP.

RMP ALTERNATIVES CONSIDERED

The analysis of the management situation and all other previously developed information formed the basis for formulating alternatives. In accordance with applicable laws, regulations, and policies, the alternatives ranged from favoring resource protection, to commodity production, to continuing the current direction and intensity of management (No Action).

Alternative A: No Action

The No Action Alternative addresses the continuation of existing management practices at current levels and intensities. No management actions or changes designed to resolve planning issues are proposed under this alternative.

Alternative B

This alternative resolves any significant conflicts with livestock grazing in favor of the non-livestock resources. This type of conflict resolution allows benefits to accrue mostly to wildlife, wild horses, and watershed values. Livestock grazing would be curtailed and/or eliminated on some allotments to allow other uses and initial forage allocation would decrease. Land disposals would be limited to those areas identified for such use, and major transportation/utility corridors would be formally designated. Nine areas would be designated for special management (Areas of Critical Environmental Concern [ACECs], Outstanding Natural Areas [ONAs, etc.], and present oil and gas categories would become more restrictive in those areas in order to preserve wildlife and watershed values, Off-road Vehicle (ORV) use would be limited to existing roads and trails in seven allotments.

Alternative C

This alternative is designed to maximize livestock production. Other resource production would be enhanced only to the point that it does not conflict with livestock use. All competitive forage would be allocated to livestock. Noncompetitive forage would, in turn, be allocated to wild horses and mule deer. Lands actions would follow the Alternative B proposal because there is no conflict with livestock. No special designations (ACEC, ONA, etc.) would be made, and all public lands in the resource area would remain open to mineral entry except those under protective withdrawal, ORV use of the area would be curtailed during periods of livestock use. Twenty-four allotments would be closed to ORV use to protect rangeland values.

Alternative D

This alternative represents a balance of resource uses in the HRRA, and is the selected alternative. Livestock use would initially be licensed at the existing active preference level. Grazing allotments would continue to be monitored to identify problems, stocking adjustments, and needs. Forage for wildlife would be allocated to maintain current wildlife numbers and permit continued population growth. Present wild horse management would continue in accordance with the Wild Horse and Burro Act of 1971. Lands actions would follow the Alternative B proposal, and nine areas would be designated for special management (ACEC, ONA, etc.). Present oil and gas

CHAPTER 1: INTRODUCTION

categories would become more restrictive in those areas. Lands would remain open to mineral entry except where withdrawn. ORV use would be limited and controlled to protect watershed and wildlife values.

REASON FOR SELECTION

This RMP for the HRRR presents the decisions for future resource management on over 2.2 million acres of public lands. It is presented here with management goals and objectives, implementation priorities, support requirements, and monitoring procedures and standards for each program.

The rationale for selection of the RMP is as follows:

- Of the alternatives considered, the selected plan was judged best to maximize resource values for the public, based on the concept of sustained yield and multiple-use management.
- The planned actions are in conformance with pertinent laws, regulations, and policy. These actions will protect unique and sensitive resources or areas while allowing balanced and diverse resource uses.
- The plan makes the most judicious use of the lands, considering the long-term needs of future generations for renewable and non-renewable resources.
- The plan best fulfills the BLM's statutory mission and responsibilities, giving consideration to environmental, scientific, educational, and economic factors.
- Based on comments received during public review and information developed earlier in the planning process, the plan provides the best combination of uses to achieve legislative mandated management objectives. The plan considers pertinent and prescribed decision factors, including ecological site conditions, existing uses, and relative values of resources within the HRRR. All practical means to avoid or minimize environmental harm from the selected alternative have been adopted in the decisions.

No protests on the Proposed RMP/Final EIS were filed, and the Governor's consistency review did not identify any conflicts of the proposed RMP with state or local plans, programs, or policies. The selected RMP is, therefore, virtually identical to the proposed RMP. The only changes are those resulting from minor corrections and additions for clarification. Appendix 1 shows the revised table of grazing allotments and a complete listing of priorities for allotment development.

MONITORING

Monitoring standards and intervals for resource Programs are defined in the discussion of each respective Program. The purposes of monitoring and evaluation are to:

- Determine success of decisions or need for modification.
- Identify unanticipated effects.
- Determine if estimated effects of management actions are accurate.
- Track plan implementation (progress in implementing the decisions and development of activity plans).

The initial intervals for monitoring are five years or less. Those intervals may be later reduced or increased, depending on the needs or effects identified. Monitoring will also determine when revision of the plan is necessary. When plan maintenance or amendment is inadequate to keep the RMP current with changing policies, resource conditions, or circumstances, a new RMP will be prepared.

COSTS OF IMPLEMENTATION

The costs of implementing the proposed RMP will generally approximate the HRRR's current operating budget. Additional costs from more intensive management of some programs, however, will occur for the following activities:

- Administrative costs of special management designations, Allotment Management Plans (AMPs), Habitat Management Plans (HMPs), other activity plan development, and on-the-ground management.

CHAPTER 1: INTRODUCTION

- Design and construction of proposed range developments, including vegetation treatments.
- Supervision of livestock use and monitoring and evaluation of decisions once they have been implemented.
- Installation and maintenance of wildlife habitat improvements.

Administration costs for all programs are currently about \$389,000 per year. As the proposed programs are implemented, these costs could increase if inflation is a significant factor in the economy. Full implementation of the plan is anticipated in 20 years.

Range improvement project costs average \$85,000 annually (in today's dollars) and will be expected to remain about the same. Annual project maintenance costs are estimated at \$2,100 for new developments, in addition to maintenance for existing developments. Additional costs associated with more intensive management are expected to approximate \$25,000 per year.

Thus, the total cost of implementation, in today's dollars, is estimated at approximately \$500,000 annually.

ORGANIZATION OF THE PLAN

The RMP is organized by resource program in the order shown on the Chapter 2 cover page. A margin index is provided to assist in locating each resource program. Each discussion is preceded by a brief description of that resource program. The elements of the plan are then presented: goals and objectives, proposed actions, support requirements, implementation priorities and plan monitoring and evaluation. To allow space for recording plan maintenance notes and monitoring entries, the elements of the plan are presented in a single column on each page.

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The Resource Management Plan for the House Range Resource Area

Range Management/
Rangeland Program Summary 

Wildlife 

Wild Horses 

Recreation 

Cultural Resources 

Lands 

Minerals 

Watershed 

Forest Resources 

Fire Management 

Appendices 



MARGIN INDEX
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CHAPTER 2

THE RESOURCE MANAGEMENT PLAN

RECORD OF DECISION

ADMINISTRATIVE FEATURES

The overall management must guide the multiple-use management of all actions and resources; including those which were not issues related or addressed in this plan. Those lands, resources, and programs not affected by the resolution of any issue or management concern would be managed in the future as they are at present (i.e., where no problem was identified that needed corrective action, no action has been prescribed).

Any future changes in management situation not addressed in the plan would be permitted on a case-by-case basis in accordance with applicable laws, regulations and policies.

Wilderness Study Areas (WSAs) will continue to be managed under BLM's wilderness Interim Management Policy (IMP), until Congress makes a decision as to their designation. Any decision to designate wilderness in the HERRA would constitute a plan amendment.

Major lands actions, such as Project BOLD, will be resolved by legislative action and are not addressed in this plan.

Site-specific improvement projects are not proposed for each individual resource at this level of planning. Resources that require priority management attention have been identified and a program has been outlined to reach the management objectives. Site-specific improvement project planning will take place during resource plan preparation and as individual projects are needed.

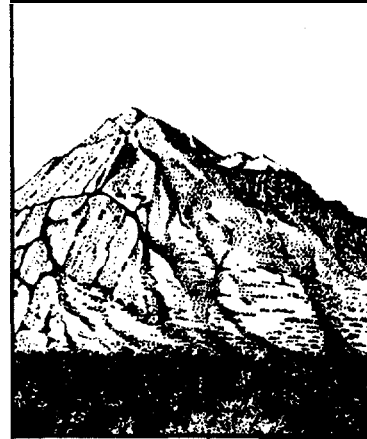
STANDARD DESIGN CONSTRUCTION AND OPERATION FEATURES

The following protective measures will be required as standard procedures:

- Existing access will be used to protect archaeological sites where possible. Soil disturbance at all projects will be held to a minimum.
- No vegetation clearing of project sites will be allowed except as authorized by the authorized officer.
- If necessary, disturbed areas will be re-seeded to provide ground cover and minimize soil loss.
- Site factors such as slope, precipitation, exposure, soil depth and erosion hazard will be criteria used in selecting sites for land treatments.
- A survey of potential habitat for threatened and endangered (T&E) species (including any sensitive species under consideration for formal designation as T&E) will be made prior to taking any action that could affect these species. Should ELM determine that there might be an effect on listed species, formal consultation with the Fish and Wildlife Service will be initiated.
- Cultural inventories will be required for all project sites (as specified in BLM Manual 8111.14) prior to new construction. BLM has entered into a memorandum of understanding with the Utah State Historic Preservation Officer regarding protection of cultural resources.
- When possible, water for wildlife will be maintained throughout the year at established watering facilities.
- The authorized officer will be notified if paleontological remains are encountered during any land treatment or construction activities. Recovery, protection, and preservation measures will be implemented, as necessary, to mitigate adverse impacts.

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

- Prior to development of projects, provision of the Memorandum of Understanding of April 1, 1979 between the BLM, Forest Service, Utah Division of Wildlife Resources and Soil Conservation Service and the master Memorandum of Understanding between BLM and Utah Division of Wildlife Resources of June 1979 will be met. These memoranda provide for coordination in the development and establishment of guidelines for buffer zones for water and other developments.
- All improvement projects will be designed and constructed in such a manner so as to minimize environmental impact while maximizing function and cost effectiveness. Prior to the installation of any new range improvements, an environmental assessment (EA) will be prepared analyzing the alternatives for the development. The EA will then be used to assist in the development of the final project design.
- All areas where land treatments are proposed will be totally rested from livestock grazing for a period necessary to allow for the recovery and re-establishment of key forage species. The minimum requirement will be to rest for one full growing season and until seed ripe time for the following season.
- Vegetation treatment projects will be designed in irregular patterns creating an "edge" effect, with islands of vegetation left intact for wildlife cover. All land treatment projects on crucial wildlife ranges will be limited in size, where necessary, by the cover requirements of wildlife. Proper mitigation measures will be incorporated.
- Consultation with the affected interest groups will be required before any vegetation treatment project is initiated.
- Before chemicals are applied, the BLM will comply with the Department of the Interior regulations. All chemical applications will be carried out in compliance with the State pesticide laws of Utah.



Range Management/ Rangeland Program Summary



CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

RANGE MANAGEMENT/ RANGELAND PROGRAM SUMMARY

INTRODUCTION

The Resource Management Plan (WMP)

The following discussion presents the RMP for the range management program in the HRRRA. It also constitutes the Rangeland Program Summary (RPS). In accordance with BLM Washington Office (WO) instruction Memorandum (IM) No. 86-462 and other planning guidance, rangeland management objectives and actions necessary to achieve those objectives are identified. The priorities for monitoring and management action are also defined by allotment. Allotment boundaries are shown on Map 1.

Actions taken and accomplishments made toward achieving RMP objectives will be communicated to the public and land users through RPS updates. An RPS update will be distributed in three to five years. At the end of five years, decisions or agreements regarding livestock forage allocations on all allotments will be made.

The HRRRA is divided into two distinct geographical and ecological regions. The western area comprises the desert basins which are dominated by the desert shrub community. The dominant plant species in this community is shadscale. The eastern region, which is characterized by the Tintic and Oak Creek mountain ranges, is made of big sagebrush, pinyon-juniper and mountain shrub communities.

A list of sensitive plants known to occur in or near the area is found in Table 2.1. Threatened or Endangered Species (T&E) are not known to occur in the HRRRA.

Presently, 197 permittees graze livestock on 101 allotments and 2,197,937 acres of public rangeland in the resource area. This represents 98 percent of the resource area that is within allotment boundaries. There is an additional 47,377 acres in unallotted category.

Of the 197 permittees, 158 have cattle permits (either yearling or cow/calf), 34 have sheep permits, and five dual use permits (sheep and cattle). Fifty-one permittees have more than one allotment, and 35 have permits/allotments in other districts/resource areas.

At the present time there are 101 allotments, 57 are individual and 44 are common use. Sixty-six cattle allotments, 26 sheep allotments, and nine dual use (cattle and sheep allotments) are in the resource area.

Portions of six of the 101 allotments (i.e., Table Mountain, Death Canyon, Sheep Rock, Maple Peak, Kimball Creek, and West Mona) are in the Salt Lake District. Portions of two allotments (Black Rock and Fandangle) are in the resource area but are administered and managed by the Salt Lake District. Three allotments (Marble Wash, Warm Creek, and Devils Gate), are managed by the Ely District in Nevada. The BLM cooperatively manages the Wringer Canyon Allotment for the Fishlake National Forest, Fillmore Ranger District, in accordance with the Dust Bowl Allotment Management Plan (AMP).

Current estimates of rangeland condition and trend have been recorded from permanent plots in 101 allotments and summarized on Table 2-2.

**TABLE 2-2
Range Condition
(Based on Ecological Site Information)**

Condition	Western Desert Topaz	Eastern Sem-Desert Upland Tintic	Total	Percent
Excellent	128,763	18,006	146,769	6.7
Good	702,471	230,442	932,913	42.4
Fair	645,891	51,770	697,661	31.7
POW	120,504	8,468	126,972	5.9
Other ¹	156,103	135,519	291,622	13.3
Total	1,753,732	444,205	2,197,937	100.0

¹ The "Other" category represents areas that may be rough and inaccessible, contain sparse vegetation, treatment areas, or have not been classified.

Apparent Range Trend

Trend Indication	Western Desert Topaz (acres)	Eastern Semi-Desert Upland Tintic (acres)	Total Acres ¹	Percent
Improving	84,766	44,842	129,610	5.9
static	1,600,756	353,661	1,954,617	88.9
Declining	68,208	45,502	113,710	5.2
Total	1,753,732	444,205	2,197,937	100.0

TABLE 2-1

Threatened, Endangered, and Sensitive Plant Species
HRRA

Species	Common Name	Status ¹	Habitat/Location*
Known Population in the HRRA:			
<i>Astragalus Uncialis</i>	Current milk-vetch	BLM Sensitive and FWS Category 2 <i>Federal Register</i> Nov. 85.	Elev. 4,650 ft. <i>Atriplex confertifolia</i> . Association in and near small wash areas. Old lake shores, gravel. Millard County and Nye County (Nevada).
<i>Atriplex canescens</i> var. <i>gigantea</i>	Giant four-wing saltbush	BLM Sensitive and FWS Category 2 <i>Federal Register</i> Sept. 85	Elev. 5,000 ft. Restricted to the sand dunes in the Rockwell Natural Area. Eastern Juab County.
<i>Hackelia ibapensis</i>	Deep Creek Mt. Stickseed	BLM Sensitive and FWS Category 2 <i>Federal Register</i> Sept. 85.	Elev. 8,000-10,000 ft. Upper reaches of the Deep Creek Mtns. Western Tooele and Juab Counties.
<i>Penstemon</i> <i>Tidestromii</i>	Tidestrom beardtongue	BLM Sensitive and FWS Category 2 <i>Federal Register</i> Sept. 85	Elev. 5,600 to 8,200 ft. variety of substrates, Desert shrub, snow- berry and juniper communities. Juab County.
Known Populations in Adjacent Resource Areas/Counties That May Occur in HRRA:			
<i>Cryptantha compacta</i>	Compact catseye	BLM Sensitive and FWS Category 2 <i>Federal Register</i> Sept. 85.	Elev. 5,000 to 6,500 ft. Sevy dolomite formation gravelly foam, open slopes and ridges, outcropping covered with shallow soil layer; desert shrub and grassland community. Millard County.
<i>Eriogonum</i> <i>ammophilum</i>	Sand-loving buckwheat	BLM Sensitive and FWS Category 1 <i>Federal Register</i> Sept. 85.	Elev. 5,270 ft. Quaternary alluvium, sandy soil. Mountain shrub community. Millard County.
<i>Penstemon concinnos</i>	Tunnel spring beard tongue	BLM Sensitive and FWS Category 2 <i>Federal Register</i> Sept. 85.	Elev. 5,500 to 7,500 ft. Sevy dolomite formation gravelly soil; pinyon-juniper woodland. Beaver and Millard counties.
<i>Sphaeralcea</i> <i>caespitosa</i>	Jones globe mallow	BLM Sensitive and FWS Category 2 <i>Federal Register</i> Sept. 85.	Elev. 5,000 to 6,500 ft. Sevy dolomite, rocky calcareous soil, mixed shrub, pinyon-juniper. and grass community. Beaver and Millard Counties.
<i>Frasera gypsicota</i>	Green gentiar	BLM Sensitive and FWS Category 1 <i>Federal Register</i> Sept. 85.	No information available.
<i>Townsendia Aprica</i>	Last Chance townsendia	Endangered. <i>Federal</i> <i>Category 2 Register</i> Aug. 85	Elev. 6,500 to 8,000 ft. Arapian shale, scattered lava boulders in sandy soil; mixed pinyon-juniper grassland community. Sevier County.

New Species Not Yet Classified:

A new plant species *Primula domensis* has recently been discovered in the San Francisco Mountains, south of the HRRA. As more data becomes available, it may be identified as a Candidate Review or Threatened or Endangered species in the near future.

Note: FWS Category 1 - Plant species for which there is substantial data to support a recommendation as endangered.

FWS Category 2 - Plant species in which more data is needed to make a biological assessment as endangered.

¹USDI, FWS, 1983; FWS. 1984; USDI, FWS. 1985.

*Welsh and Thorne, 1979.

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

Stock water availability continues to be one of the major limiting factors in achieving proper livestock distribution throughout the resource area. Range suitability, based on water availability, is difficult to portray because of the uncertainty of snow on many winter sheep allotments and the hauling of water by permittees on a seasonal basis. It is known, however, that portions of many grazing allotments (particularly cattle allotments) are under-utilized and/or over-utilized because of lack of well-distributed water sources.

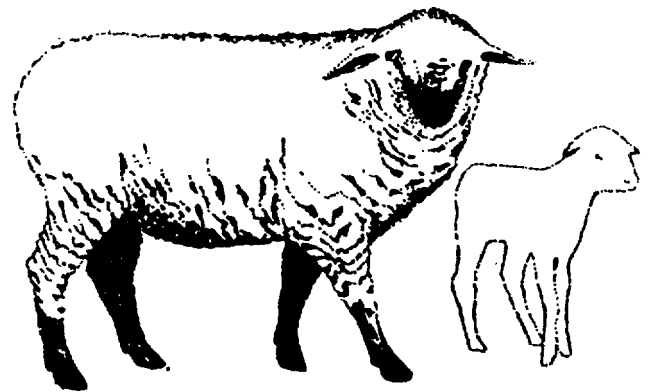
To offset these uncertainties, water development has received priority consideration for project construction. Forty nine wells, 44 reservoirs, and 13 catchments (guzzlers) provide water for livestock, wild horses, and wildlife. These improvements are widely scattered throughout the resource area.

There are over 440 miles of existing fenceline on public lands in the HRRRA. The majority of the fences consist of barbed wire along cattle allotment boundaries in the Tintic region and the south and western regions of the Topaz unit. Some sheep-tight woven wire fences are in the Topaz and Tintic units. However, the majority of the sheep allotments remain unfenced because of conflicts with antelope migration, economic constraints, and the control of sheep bands by herders. The unfenced winter sheep allotments have allotment boundaries that are posted or designated by topographic barriers.

Seedings have been established in many of the sagebrush and pinyon-juniper communities utilizing such techniques as chaining, raiing, or prescribed burning. The majority of these treatments have been restricted to semidesert, shallow loam, upland shallow loam, and upland stony loam range sites. Success has generally been good with yields estimated to average near 650 pounds air-dry forage per acre annually. Grazing capacity for livestock is estimated to average about 4.9 acres per AUM on these treatment areas. Approximately 63,022 acres have been seeded, and about 89,000 additional acres identified that have good seeding capabilities.

GOALS AND OBJECTIVES

- Provide a balanced allocation of forage for livestock, wild horses, and big game while ensuring the protection of rangeland values and providing a stable, renewable forage base (to be accomplished within five years of Final RMP approval).
- Reduce or eliminate rangeland resource problems on 32 priority allotments identified for intensive management.
- Maintain or improve current resource conditions on the remaining 69 allotments.
- Maintain a livestock production goal of approximately 155,000 AUMs over the long term (20 years).
- Control noxious weeds and pests to protect range sites.



CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

PLANNED ACTIONS

Implementation

Monitoring

Modification

Establishment of Livestock Grazing and Unallotted Areas

- 1 Areas presently unallotted for livestock use will remain unallotted unless environmental analysis determines that grazing is a compatible use for the areas.
- 2 Livestock grazing will remain as an allowable use on approximately 2,197,937 acres (98 percent of the total Federal range) within the resource area. Federal ranges will be closed to grazing only under the authority of emergency conditions or land withdrawals.

Initial Forage Allocation

- 3 Allocation of forage for livestock use will not be made at this time. Monitoring studies (actual use, utilization, trend, precipitation data) will be continued to obtain data needed to support future forage allocation. It is anticipated that within five years all allotments within the area covered by this document will have forage allocated. Until determined otherwise, livestock forage is and will continue to be used at the current active preference level (See Appendix 1).

Prioritization of Allotments for Management and Development

- 4 Allotments have been categorized according to criteria in WO IM 82-292 (final Grazing Management Policy). The allotments within each category may change as new data is obtained or resource conditions change. These changes will be made by cooperative agreement or by decision of the area manager.
- 5 The following lists the allotments by category, priority for action, and action that needs to be taken:

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

CATEGORY I (IMPROVE)	Implementation	Monitoring	Modification
ACRES			
FEDERAL			
ALLOTMENT NAME	RANGE	PRIORITY	DECISION'
Beryllium	8,387	13	A, B
Big Hollow	3,978	44	A, D
Boulter	8,613	39	B, D
Broad Canyon	4,412	54	E
Callao Bench	18,803	33	D
Cedar Springs	628	53	E
Chriss Creek	1,144	35	D
Cove	3,183	38	
Cutler	120	52	E
Dear Foot	1,868	42	0
Dust Bowl (AMP)	11,326	8	C, D
Femer Dog Valley (AMP)	18,591	2	A, C, D
Finlinson 21A	1,351	45	D
Gandy (AMP)	52,515	47	C, F, G
Gilson	20,582	23	A, D
Jakes Canyon	2,069	29	A
Jenny Lind	1,321	41	D
Juab	1,253	9	A, B, D
Kimball Creek (AMP)	20,600	7	AC, D
Klondike	2,072	27	A, D
Levan	3,390	32	B
Lymndyl	11,154	2B	A
Maple Peak	59,520	1	A, B, D
McIntyre	51,610	22	B, D
Mountain	5,170	14	B, D

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

				Implementation	Monitoring	Modification
Middle Fork (AMP)	3,178	15	A, C, D			
Mills	9,353	31	B			
Nelson	8,288	29	A, B			
Nephi, Bench	1,387	51	E			
North Scipio (AMP)	4,525	16	A, C, D			
Oak City	19,281	37	A, B			
Okelberry (AMP)	5,633	3	A, C, D			
Paint Mine	2,674	30	A, F			
Riley Spring	3,469	40	D			
Rocky Ford (AMP)	10,008	17	C, D			
Round Valley (AMP)	3,639	48	C			
Sage Valley 16 (AMP)	4,916	5	A, C, D, F			
Sage Valley 17 (AMP)	11,044	4	A, C, D			
Sevier River	5,331	6	A, B, D			
Shearing	32,629	21	B, D, F			
Sheep	25,114	50	B, E, F			
Sheep flock (AMP)	20,767	11	C, D			
Smelter Mountain	60,057	49	B, E, F			
Snadge Hollow	3,399	26	A, D			
Spring Canyon	4,562	24	A, D			
Stone	2,303	26	A, D			
Stone Quarry	3,466	38	B, D			
Summit	3,752	18	A, C, D			
Tatow	56,839	46	B, G			
Thourand Peaks	332,022	20	B, D, F, G			
Valley Mountain	1,819	34	A, D			
Washboard	4,477	10	A, B, D			
West Mona	17,316	43	B, D, F			
Yuba	3,850	12	A, B, D			
Total	971,602					

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

CATEGORY M (MAINTAIN)				Implementation	Monitoring	Modification
ALLOTMENT NAME	ACRES FEDERAL RANGE	PRIORITY	DECISION			
Antelope	72,102	2	A, G			
Bitner Knoll	21,170	1	A			
Blue Spring	2,445	29				
Boyd Station	21,773	17	F			
Callao	20,794	16	F			
Cals Valley	2,244	20				
Chalk Knolls	45,527	30				
Cherry Creek (AMP) ²	36,562	14				
Chicken Creek	495	46				
Cowboy Pass (AMP) ²	41,059	19	C, G			
Coyote Knoll	34,934	24	G			
Crater	56,561	31				
Death Canyon	50366	10	A, C			
Desert Mountain	36,610	21				
Devils Gate	4,159	33				
East Fish Spring	50,930	31				
East Topaz (AMP) ²						
Flint	16,176	37				
Freighter	13,216	36				
Henry Crest	6,200	39				
Kane Spring	2,976	25				
Knoll Spring	11,652	32				
Lady Laird	53,797	6				
Little Drum	66,914	3				
Lunt-Latimer	592	41				
Meadow Creek	46,475	36				
Marble Wash	21,776	34				
Partoun (New) ²	71,963	2	B, F			

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

			Implementation	Monitoring	Modification
Red Butte	7,291	28			
Riverbed	52,175	8	A		
Salt Creek	3,323	11	A		
Sand Pass (AMP) ²	32,333	1	A, C		
Smith Creek	15,219	27			
Spor Mountain	53,053	26			
Sugarville (NDW) ²	51,391	13	B, F		
Swasey Knoll	47,262	4	A, G		
Swasey Knoll	36,469	5	A		
Table Mountain	3,618	43			
Topaz	3,124	22			
Tule Spring	14,986	42			
Tule Valley	14,500	23			
Warm Creek	6,050	35			
Wild Horse	44,383	9	A		
Twelve B	200	44	E		
Total	1,226,106				

CATEGORY C (CUSTODIAL)

ALLOTMENT NAME	ACRES FEDERAL RANGE	PRIORITY	DECISION
Fool Creek 1	959	1	A
Fool Creek 1	120	2	N/A
Garrett	780	3	N/A
TOTAL	1,859		

1

DECISION KEY

- A. Take administrative action or continue range studies to implement changes in allocation.
- B. Prepare an AMP
- C. Continue/Modify current AMP
- D. Improve Vegetation
- E. Re-evaluate for possible re-categorization.
- F. Evaluate for possible re-categorization.
- G. Allocate AUMs for wild horses

2. These six allotments show little potential for increase in AUMs through improvement management or additional development. However, there is a definite possibility that existing AUMs could be lost unless some development is implemented. As the rangeland program is further refined and implemented, the categorization of these allotments could change, or at least some investments made, because of the potential for loss if further action is not taken.

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

	Implementation	Monitoring	Modification
6	Livestock forage allocations for all allotments will be made. Priority for forage allocation will be:		
	1. By agreements for the following 38 allotments where adjustments are indicated (See Appendix 1) during the five year monitoring period:		
	Maple Peak		
	Ferner Dog Valley		
	Oakelberry		
	Sage Valley 17		
	Sage Valley 16		
	Sevier River		
	Kimble Creek		
	Riverbed		
	Juab		
	Washboard		
	Salt Creek		
	Yuba		
	Beryllium		
	Middle Fork		
	North Scipio		
	Summit		
	Jakes Canyon		
	Gilson		
	Spring Canyon		
	Snadge Hollow		
	Stone		
	Klondike		
	Lynndyl		
	Nelson		
	Paint Mine		
	Valley Mountain		
	Oak City		
	Big Hollow		
	Sand Pass		
	Antelope		
	Little Drum		

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

	Implementation	Monitoring	Modification
Swasey Knoll			
Table Mountain			
Lady Laird			
Bitner Knoll			
Wild Horse			
Death Canyon			
Fool Creek 1			

7 2. By agreement for all other allotments where forage appears to be adequate (See Appendix 1).

8 3. By decision on the balance of the 38 allotments listed above following the monitoring period, if agreements have not been obtained.

9 As future adjustments in allocations are determined, announcements will be made in subsequent RPS updates.

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

Implementation

Monitoring

Modification

AMP Development or Updating

10

BLM personnel, in cooperation with affected permittees, will develop or update AMPs to implement the grazing management program. If BLM personnel and permittees fail to reach an agreement, a grazing system that protects the resource will be implemented by decision of the area manager. The permittee will, however, have the right to appeal any such decisions. Priority for development is listed below:

TOPAZ UNIT	MANAGEMENT CATEGORY	PRIORITY
Callao Bench	I	16
Cherry Creek ¹	M	22
Cowboy Pass ¹	M	29
East Topaz ¹	M	28
Gandy ¹	I	11
Mountain	I	14
Partoun	M	13
Sand Pass ¹	M	25
Sheep	I	23
Smelter Mountain	I	21
Sugarville	M	19
Tatow	I	8
Thousand Peaks	I	7

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

Implementation Monitoring Modification

TINTIC UNIT	MANAGEMENT CATEGORY	PRIORITY
Beryllium	I	17
Boulter	I	2
Dust Bowl ¹ , Juab, Levan, and Mills	I	17
Ferner Dog Valley ¹	I	4
Kimball Creek ¹	I	6
Maple Peak	I	1
McIntyre	I	3
Middle Fork ¹	I	30
North Scipio ¹	I	31
Okelberry ¹	I	5
Rocky Ford ¹	I	32
Sage Valley 16 ¹	I	9
Sage Valley 17 ¹	I	10
Sevier River	I	15
Shearing	I	12
Sheeprock ¹	I	20
Washboard	I	18
West Mona	I	26
Yuba	I	24

¹ Allotments with existing AMPs scheduled for update/revision.

Permitting Procedure

- 11 Grazing licenses/permits will specify the allotment, number of AUMs, period/pattern of use, numbers, and kinds of livestock.
- 12 BLM will also make adjustments in the grazing management program during drought or other emergencies.

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

		Implementation	Monitoring	Modification
13	Administrative adjustments could be made to: <ul style="list-style-type: none">• Authorize the movement of livestock from one pasture to another ahead of schedule if forage is lacking in the first pasture and available in the second.• Reduce livestock use temporarily if forage production is less than normal.• Authorize temporary, non-renewable use if there is an abundance of available forage.• Adjust livestock use to limit utilization of key plant species to a predetermined level based on allotment objectives.			
14	Permittees will be required to request, in writing, any desired changes in use prior to the grazing period.			
15	Grazing use outside the limits of the authorized allocation and without prior authorization will be considered unauthorized grazing use.			
16	Should unauthorized grazing occur, BLM will take action to ensure it is eliminated and that payment is made for vegetation consumed and/or damage done.			
17	Marking of livestock (preferred methods are ear tagging or dye marking) may be required to: <ul style="list-style-type: none">• Obtain Actual Use Data• Determine Proper Stocking Levels• Document Unauthorized Use• Monitor Livestock Movement• Verify Allotment Boundary Problems			
	Conversion in Kind/Class Livestock			
18	Conversions in both kind and class of livestock may be authorized on a case-by-case basis, providing a feasibility study and accompanying Environmental Assessment (EA) indicate such conversions are justified.			
19	Priority for consideration will be given to: (1) those operators who are considering dual use (sheep and cattle) as a management tool; and (2) those operators that would have the flexibility to change from sheep to cattle on west desert allotments suitable for that conversion.			

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

Livestock Season of Use Adjustments

Implementation

Monitoring

Modification

- 20 The existing seasons of use by livestock were primarily established to accommodate the needs of ranching operations but may change if monitoring determines a change is needed.
- 21 Major adjustments to season of use will be evaluated upon request or when resource conditions indicate a change is needed. A suitable analysis and EA will be completed prior to any major changes.
- 22 The 14 grazing allotments listed below will receive priority for monitoring to determine the impacts of spring grazing. Other allotments may be included for monitoring as operators or conditions change in other grazing areas.

Allotments with Continous Spring Use by Cattle

Topaz Unit	
Allotment	Federal Acres
Boyd Station	21,173
Callao	20,794
Cherry Creek	36,562
East Fish Springs	30,930
Gandy	52,515
Partoun	71,963
Sheep	25,114
Smelter Mountian	60,057
Sugarville	51,391
Thousand Peaks	332,022
Subtotal	722,541
Tintic Unit	
Paint Mine	2,674
Sage Valley 16	4,916
Shearing	32,629
West Mona	17,316
Subtotal	57,535
Total Acres	760,076

- 23 Should evaluations determine that early spring grazing by cattle is contributing to declining range conditions, one or more of the following steps may be employed:
1. The spring period will be shortened.
 2. Alternate year spring rest will be required through a grazing system.
 3. Spring grazing will be eliminated.

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

RANGE IMPROVEMENTS

Implementation

Monitoring

Modification

Structural

- 24 Continue to plan and install structural improvements, such as fences, water developments, cattleguards, etc., on a priority basis as funds become available. Projects must be environmentally acceptable and should have a favorable benefit cost ratio. See prioritization of allotments for management and development.
- 25 Continue to collect fees from permittees for maintenance of water developments such as pipelines, springs, and wells. The amount of the fees will be determined by the area manager and the grazing advisory board.
- 26 Maintenance of all structural-type facilities, excluding water developments, will continue to be the responsibility of the permittees.
- 27 Water developments will be periodically inspected to ensure that they remain in usable condition. Preventive maintenance will be performed as needed.
- 28 Wildlife escape devices will be installed and maintained in all water troughs.

Non-structural improvements

- 29 Conduct vegetation treatment projects on 31 priority I allotments. The following lists those allotments where vegetation treatment will be done in present priority order:

Allotments	Category	Acres Suitable for Treatment
Maple Peak ¹	I	16,000
Kimball Creek ¹	I	5,500
Shearing ¹	I	12,000

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

Implementation

Monitoring

Modification

<i>Allotments</i>	<i>Category</i>	<i>Acres Suitable for Treatment</i>
Okelberry	I	1,000
Sewier River	I	1,500
Big Hollow	I	400
Snadge Hollow	I	400
Stone	I	700
Riley Spring	I	1,000
Stone Quarry	I	1,500
Jenny Lind	I	685
Sheep Rock ¹	I	5,000
Rocky Ford	I	800
Chriss Creek	I	550
Juab	I	500
Gilson	I	1,600
Summit	I	300
Washboard	I	2,500
Yuba	I	1,850
Middle Fork	I	2,400
Dust Bowl ¹	I	3,200
McIntyre ¹	I	8,000

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

Implementation

Monitoring

Modification

Allotments	Category	Acres Suitable for Treatment
Ferner Dog Valley ¹	I	4,500
Sage Valley 16 ¹	I	2,500
Sage Valley 17 ¹	I	2,000
North Scipio	I	1,500
Klondike	I	243
Deer Foot	I	500
West Mona	I	400
Boulter	I	1,200
Spring Canyon	I	1,500
Total		817,282

¹ Approximately 70 percent of all treated would occur in these nine allotments.

² Includes total acres suitable in these allotments. However, not all of these acres would be treated (approximately 65,000 acres over 20 years).

30 Plan seeding mixtures to emphasize watershed stabilization, herbaceous cover, establishment of wildlife browse species, and improved livestock grazing forage.

31 Encourage cost/share opportunities with permittees, benefiting groups/association and cooperative agencies.

Grazing in Riparian Habitats

32 The estimated 2,500 acres of riparian habitat in the resource area would be evaluated and monitored for resource condition within three years. The perennial streams of the Deep Creek Mountains would receive first priority.

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

Names of streams, springs and wetlands are listed below: **Implementation** **Monitoring** **Modification**

Basin Creek*
Birch Creek*
Cherry Creek
Cottonwood Canyon Creek*
Cow Hollow Creek
DMAD Reservoir
Granite Creek*
Indian Farm Creek*
Red Cedar Creek*
Sevier River
Sevier Bridge Reservoir (Yuba)
Tom's Creek*
Trout Creek*
Antelope Springs
Baker Hot Springs
Cane Springs
Cold Spring
Coyote Springs Complex
Salt Marsh Lake Complex
Swasey Springs
Topaz Slough
Tule Spring
Twin Springs
Willow Spring

*Deep Creek Mountain Creeks

- 33 Where resource conditions show a need for protection from livestock grazing, management options of seasonal deferment, off-site water development, and/or enclosure fencing with water gaps would be applied as necessary.
- 34 No range improvement projects will be authorized in riparian areas, unless these will maintain or improve riparian habitat.

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

	Implementation	Monitoring	Modification
Weed and Insect Control			
35	Inventory knapweed and other noxious weeds by 1989 and update the inventory every three to five years.		
36	Develop a cooperative plan for control of knapweed and other noxious weeds with county and private land owners.		
37	Cooperate with Animal and Plant Health Inspection Service (APHIS) for control of grasshoppers and Mormon Crickets.		
38	Chemical treatment will consist of applying approved chemicals to control areas of noxious or poisonous plants.		
Predator Control			
39	Predator control will continue in accordance with the Richfield District Animal Damage Control Plan, to be reviewed annually.		

Threatened, Endangered and Sensitive Plant Species

A survey of potential habitat for T&E species (including any sensitive species under consideration for formal designation as T&E) will be made prior to taking any action that could affect these species. Should BLM determine that there might be an effect on listed species, formal consultation with the FWS will be initiated.

SUPPORT REQUIREMENTS

Support will be needed from the soil, water, and air programs for conducting ground water and well site investigations on proposed well sites and spring developments.

Division of Operations support will be needed for designing projects, for construction and/or installation, and for some contracting and maintenance purposes.

PLAN MONITORING AND EVALUATION

Monitor this plan each year to determine which items need to be brought forward into the Annual Work Plan (AWP). On a periodic basis the rangeland program will be evaluated to determine progress in decision implementation and if goals and objectives are being met. If significant progress or major changes have been made, then this will be announced in RPS updates.

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Wildlife



CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

WILDLIFE

INTRODUCTION

Several species of wildlife inhabit the HRRRA. Map 2 shows mule deer, elk and Rocky Mountain bighorn sheep habitat. The planning decision deals with those of highest concern. These include four species of big game animals, two Federally listed endangered species and seven sensitive species.

Riparian habitat is very scarce in the area. Eight streams on the Deep Creek Mountains are of high concern since they support, or could support, the sensitive Bonneville cutthroat trout. Five springs support least chub populations. A new species of date has recently been found, however, its significance and range is undetermined.

GOAL AND OBJECTIVES

Elements of the Plan

Manage wildlife habitat to favor a diversity of game and non-game species. Continue to provide forage for current big game numbers and prior stable or long-term management goal numbers should populations increase and habitat improvements occur. Improve habitat in poor and fair condition on crucial and high priority habitat. Protect crucial and high priority habitat from encroachment by incompatible uses. Improve riparian and fisheries habitat currently in poor or fair condition. Protect all T&E and sensitive species habitats. Overall goals and objectives for wildlife are prioritized in the following order:

- Big Game
- Habitat Management Plans (HMPs)
- T&E Species
- Riparian
- Fence Modification
- Guzzler Development
- Well Modifications

Big game objectives are prioritized in the following order:

- Mule Deer
- Elk
- Antelope
- Bighorn Sheep



CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

Implementation

Monitoring

Modification

PLANNED ACTIONS

Forage Allocation

- 1 Forage for Big Game will be allocated by the following priority:
 - Current Use
 - Objectives for Bighorn Sheep
 - Prior Stable Number of Mule Deer
 - Long Term Objective Numbers for Elk and Antelope

Appendix 1 and 2 show allocations for the various big game species. Where non-competitive forage is available, it has been allocated as far as possible to meet prior stable deer numbers or objective numbers for other big game species according to the priorities above. The difference shown on the tables indicate the deficit, or surplus, of non-competitive forage available to meet objectives.

Habitat Management Plans

- 2
 - Update and combine the Trout Creek and Deep Creek Mountains HMPs and include a section for the Rocky Mountain bighorn sheep.
- 3
 - Determine limiting factors for the reintroduction of desert bighorn sheep into other areas such as Fish Springs Mountain.
- 4
 - Determine limiting factors for and importance of the least chub and the new species of dace.

Mule Deer

Mule deer herd units are listed in priority order and actions listed under each herd unit are also listed by priority.

Herd Unit 13

- 5
 - Identify and monitor springs in critical summer habitat areas.
 - Monitor critical and high priority habitats to determine limiting factors, impacts of livestock grazing and habitat trend.
 - Modify south boundary fence on Riverbed Allotment to comply with BLM Manual 1737. Other fences will be similarly modified as needs are identified.

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

		Implementation	Monitoring	Modification
8	<ul style="list-style-type: none">Designate critical winter, summer, and fawning habitat as oil and gas leasing Category 2 with seasonal restrictions to exploration and drilling from December through April and May through November, respectively.			
9	<ul style="list-style-type: none">Leave three to five acres of pinyon-juniper islands for deer cover in treatment areas and leave travel lanes on the Maple Peak and Sheeprock Allotments if a large chaining is implemented. A pasture management system will be followed which allows complete rest of some of the pastures during the summertime to provide succulent forage for wildlife.			
Herd Unit 14				
10	<ul style="list-style-type: none">Prepare a monitoring plan to determine the herd limiting factors, impacts to winter browse from livestock grazing, and trend of vegetation condition on critical and high priority ranges.			
11	<ul style="list-style-type: none">Identify ways of improving 8200 acres, plus any other identified acres of critical wildlife habitat on the following allotments: Ferner Dog Valley, Kimball Creek, Okelberry, Riley Springs, Rocky Ford, Nephi Bench, and Shearing.Modify fences to comply with BLM Manual 1737 as problem fences are identified.			
Herd Unit 42				
12	<ul style="list-style-type: none">Monitor all critical and high priority habitats to determine limiting factors, impacts of livestock grazing and habitat trend.			
13	<ul style="list-style-type: none">Improve 7300 acres of critical winter habitat on Cedar Spring, Salt Creek and Yuba Allotments,			
14	<ul style="list-style-type: none">Critical winter and summer habitats will be placed in oil and gas leasing Category 2 with seasonal restrictions on exploration and drilling from December through April and May through November, respectively.			
Herd Unit 53				
15	<ul style="list-style-type: none">Monitor all critical and high priority habitats to determine limiting factors, impacts of livestock grazing and habitat trend on Summit and Oak City Allotments.			
16	<ul style="list-style-type: none">Critical winter and summer habitat will be placed in oil and gas leasing Category 2 with a seasonal restriction on exploration and drilling from December through April and May through November, respectively.			

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

		Implementation	Monitoring	Modification
Herd Unit 54				
17	<ul style="list-style-type: none">Identify critical and high priority habitats and prepare or update a written plan which identifies priority areas for monitoring and improvements.			
18	<ul style="list-style-type: none">Implement a monitoring program as described above. The monitoring plan should be designed to evaluate the effects of grazing on browse species.			
19	<ul style="list-style-type: none">Place critical winter and spring/summer habitat in oil and gas leasing Category 2 with a seasonal restriction on exploration and drilling from December through April and May through November respectively.			
Herd Unit 62 B				
20	<ul style="list-style-type: none">Implement a monitoring plan on critical habitat to include habitats in the Sand Pass, Freightier, and Lady Laird Allotments:			
21	<ul style="list-style-type: none">Identify ways to improve critical wildlife habitat.			
22	<ul style="list-style-type: none">Implement some of the methods identified above that would improve fair and/or poor wildlife habitat conditions.			
23	<ul style="list-style-type: none">Install guzzlers on Sand Pass, Freightier and Lady Laird Allotments.			
24	<ul style="list-style-type: none">Place a seasonal exploration and drilling restriction on critical summer habitat on a case-by-case basis where an adverse impact could otherwise occur.			
Herd Unit 62 A				
25	<ul style="list-style-type: none">Identify critical and high priority habitats and prepare or update a written monitoring plan.			
26	<ul style="list-style-type: none">Implement a monitoring program as described above.			
27	<ul style="list-style-type: none">Place critical winter and spring/summer habitat in oil & gas leasing Category 2 with a seasonal restriction on exploration and drilling from December through April and May through November respectively.			
28	<ul style="list-style-type: none">Hand thin 200 acres of aspen and conifer forest inside the Deep Creek Mountains WSA and reseed with native forbs and grasses.			
29	<ul style="list-style-type: none">Modify fences to comply with BLM Manual 1737.			
30	<ul style="list-style-type: none">Hand thin 200 acres of juniper and pinyon woodland on critical winter range, to reverse downward trend.			

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

- 31 • Install guzzlers on Bitner Knoll, Callao Bench, East Fish Springs, East Topaz, Spor Mountain and Wild Horse Allotments.

Implementation

Monitoring

Modification

Elk

Herd Units 11 and 28

- 32 • Identify critical habitats and prepare a written plan which identifies areas for monitoring and habitat improvements.
- 33 • Place critical winter and spring/summer habitats in oil and gas leasing Category 2 with a seasonal restriction on exploration and drilling from December through April and May through November, respectively.
- 34 • Determine additional suitable elk habitat on reseeded areas.
- 35 • Improve 11,000 acres of critical habitat including habitat in Ferner Dog Valley, Middle Fork and Spring Canyon Allotments.

Antelope

Herd Unit 2

- 36 • Install 12 guzzlers and modify six wells as shown on the following list:

Guzzler Development Location	Allotment
T. 17 S., R. 17 W., Sec. 17, NE	Cowboy Pass
T. 15 S., R. 17 W., Sec. 33, NE	Thousand Peaks
T. 17 S., R. 17 W., Sec. 4, SW	Cowboy Pass
T. 16 S., R. 17 W., Sec. 16, SE	Cowboy Pass
T. 15 S., R. 18 W., Sec. 1, NE	Thousand Peaks
T. 15 S., R. 18 W., Sec. 23, NE	Thousand Peaks
T. 13 S., R. 17 W., Sec. 32, SE	Thousand Peaks
T. 14 S., R. 16 W., Sec. 17, SW	Thousand Peaks
T. 14 S., R. 15 W., Sec. 28, SW	Thousand Peaks
T. 14 S., R. 15 W., Sec. 4, SW	Thousand Peaks
T. 13 S., R. 15 W., Sec. 24, SE	Thousand Peaks
T. 16 S., R. 14 W., Sec. 24, NE	Antelope

Well Improvement and Location	Changes Needed
Cline Well 1295 T. 15 S., R. 15 W., Sec. 29	Maintain a constant supply of water from May to October. install access and escape ramps.
Hole-in-the-Wall Well T. 13 S., R. 16 W., Sec. 6	Replace trough, install access and escape ramps Maintain water from May to October. install wildlife trough 400 yards from well.
Indian Trail Well 2122 T. 13 S., R. 16 W., Sec. 34	Install new pump and motor, Install a wildlife trough 200 or more yards from well. maintain water from May to October.
Well 56, 4306 T. 13 S., R. 15 W., Sec. 23	Install access and escape ramps, maintain a water supply from May to October. and install a wildlife trough 400 yards from well.
Well 58, 4307 T. 15 S., R. 16 W., Sec. 11	Same as for Well 56.
West Swasey Well 2072	Same as for Well 56

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

- Modify fences to comply with BLM Manual 1737 as shown on the following list:

Implementation

Monitoring

Modification

Name	JDR		
	Number	Spacing	Change To
East Ibapah Appeal	0324	8-8-8-6-10	16-10-10-6
West Ibapah Appeal	0327	8-8-8-8-13	16-10-10-6
Goshute Fire	0337	10-10-10-10	16-10-10-6
Deep Creek Seeding 1	0341	10-10-10-12	16-10-10-6
Goshute Fire Fence 2	0372	12-10-10-10	16-10-10-6
Goshute Reservation	4005	12-12-10-10	16-10-10-6
Pinyon Flat Allotment	4052	16-16-8-12	16-10-10-6
Ibapah Seeding	4103	16-6-8-12	16-10-10-6
South Overland Canyon	4126	tower 16-6-8-16 Upper 16-13-13	16-10-10-6 16-10-10-6

- 38
- Identify critical habitat and prepare a monitoring plan to evaluate the effect of spring sheep grazing.

Bighorn Sheep

- 39
- Prepare a written report to determine the limiting factors for bighorn sheep on the Fish Springs Range. This report will include recommendations for future management of the sheep.
- 40
- Install three water guzzlers on the Fish Springs Range for bighorn sheep use pending recommendations from the written report.
- 41
- Prepare a written report to determine the limiting factors for bighorn sheep on the Deep Creek Mountains. This report will include recommendations for future management and enhancement of the sheep herd.
- 42
- Do not allow grazing of domestic sheep above the 7,000 foot contour level on the Fish Springs and Deep Creek Mountains, Enforcement of this decision could include such stipulations as conditions on licenses, signing, preparing maps, and meeting with users.

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

Threatened, Endangered, and Sensitive Species Habitat and Use

Implementation

Monitoring

Modification

- 43
- Reconstruct habitat improvement structures in six streams in the Deep Creek Mountains. Map 3 shows the Deep Creek HMP. The following lists the order of priority for these streams:
 - a. Birch Creek
 - b. Trout Creek
 - c. Granite Creek
 - d. Red Cedar Creek
 - e. Indian Farm Creek
 - f. Tom's Creek
- 44
- Prepare a written report discussing the limiting factors for the least chub in the following areas (This list is in priority order for these springs):
 - a. Salt Marsh Lake Complex
 - b. Tule Spring
 - c. Willow Spring
 - d. Coyote Spring
 - e. Cold Spring

The report will contain recommendations for management and enhancement of the species.

- 45
- Determine the importance and status of the new species of date in the resource area. Prepare a written report containing recommendations for the management and enhancement of the species.

Riparian/Aquatic Habitat and Use

- 46
- Inventory all riparian/aquatic habitat within three years. A report will be prepared showing conditions, trend, and limiting factors for each of the riparian habitats listed below. This report will also recommend methods to improve habitat in poor or fair condition. The following list shows priority for inventory:

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

	Implementation	Monitoring	Modification
NAME	LOCATION (On BLM Administered Lands)		
Tule Springs			
Twin Springs			
Topaz Slough			
	T16S RBW Sec. 6		
Salt Marsh Lake Complex			
	T15S R18W sec. 20, 30, 31		
Swarey Springs			
	T16S R13W sec. 24		
Tule Springs			
	T17S R15W sec. 3		
Twin Springs			
	T16S R18W sec. 22		
Willow Springs			
	T17S R15W sec. 3		
Coyote Springs Complex			
	T16S R15W sec. 12		
Cold Springs			
	T11S R14W sec. 4		
Cane Springs			
	T16S R15W sec. 12		
Baker Hot Springs			
	T14S R8W sec. 10		
Antelope Springs			
	T17S R13W sec. 11		
Trout Creek			
	T12S R19W sec. 12		
Tom's Creek			
	T11S R18W sec. 16		
Red Cedar Creek			
	T11S R18W sec. 31 to T12S R17W sec. 6		
Indian Farm Creek			
	T12S R18W sec. 4 to T12S R18W sec. 12		
Granite Creek			
	T12S R18W sec. 6 to T12S R17W sec. 6		
Birch Creek			
	T12S R18W sec. 25 to T12S R17W sec. 10		
Basin Creek			
	T11S R18W sec. 4 to T11S R17W sec. 6		
Cherry Creek			
	T12S R5W sec. 3		
Cottonwood Canyon Creek			
	T12S R18W sec. 4 to T12S R18W sec. 11		
Cow Hollow Creek			
	T11S R5W sec. 5 to T11S R5W sec. 8		
Sevier River			
	T15S R2W sec 8 to T14S R2W sec. 8		
Sevier Bridge Reservoir			
	T17S R2W 1W		
(Yuba)			

47

- Place all riparian habitat in oil and gas leasing Category 3.

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

SUPPORT REQUIREMENTS

Bighorn Sheep

The Division of Operations may be needed to accurately identify and mark the 7,000 foot contour level. The division may also assist in construction of guzzlers.

The range program will need to take necessary actions to implement the 7,000 foot contour level closure.

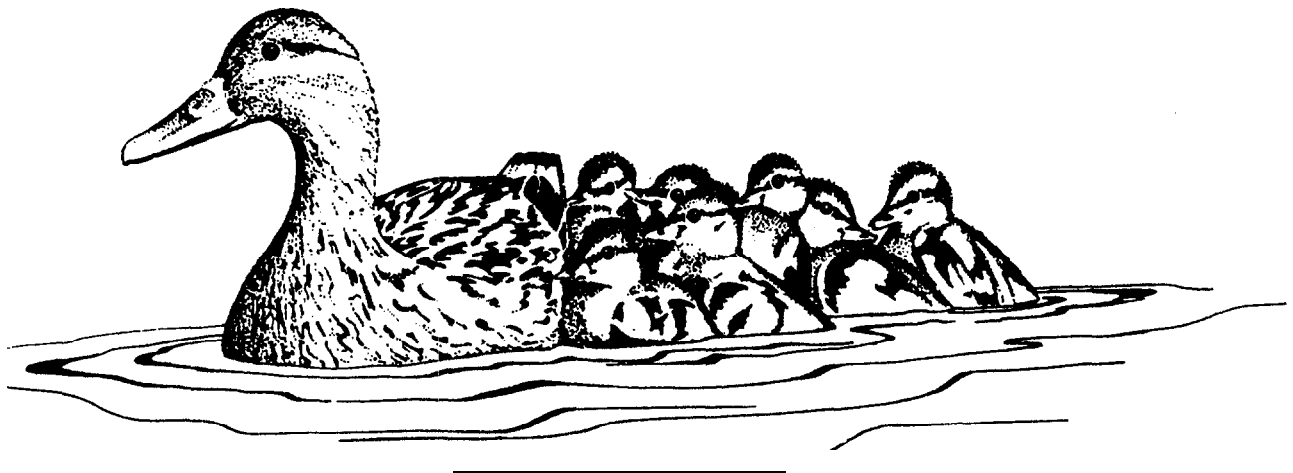
Riparian/Critical/High Priority Habitat

The minerals program will need to implement appropriate oil and gas leasing categories on riparian critical and high priority areas.

PLAN MONITORING AND EVALUATION

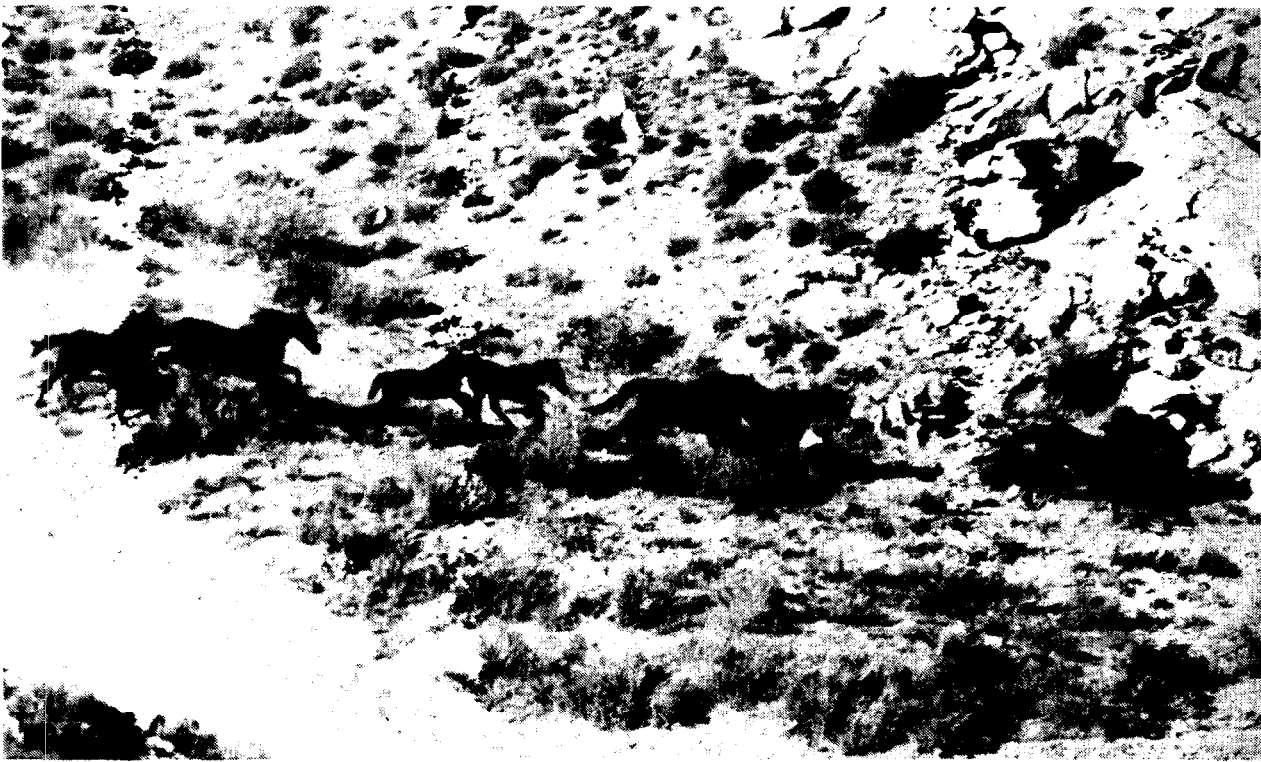
Monitor this plan each year to determine which items need to be brought forward into the Annual Work Plan (AWP).

At least every five years the wildlife program will be monitored and evaluated to determine its effectiveness in meeting goals and objectives.



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Wild Horses



CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

WILD HORSES

INTRODUCTION

There are two Herd Management Areas (HMAs) (Confusion Herd Management Area-235,005 acres; Swasey Herd Management Area-120,113 acres) located in the resource area. Map 4 shows wild horse herd boundaries and critical areas. Wild horses in the HRRRA have been managed under provisions of a wild horse capture plan completed in 1977. Wild horses have been captured and removed periodically under provisions of this plan to maintain horse numbers at levels commensurate with available forage and herd management objectives.



GOALS AND OBJECTIVES

Wild horses will continue to be managed in accordance with provisions of the Wild Horse and Burro Act of 1971 and subsequent legislation and regulations. Herd Management Plans will be completed to provide detailed guidance for management of individual HMAs.

PLANNED ACTIONS

Implementation Monitoring Modification

- 1 Continue established HMAs (See Table 2-3 for forage allocations).

TABLE 2-3
Forage Allocation

- 2 Wild Horse numbers in the two HMAs will be maintained near the following levels:

HMA	Max-Number	AUMs	Minimum Numbers	AUMs
	Horses		Horses	
Confusion	115	1380 aums	70	84
Swasey	100	1200 aums	60	72

- 3 Forage allocation for wild horses is shown below. This allocation provides a buffer of 324 AUMs for the numbers proposed above.

HMA	Allotment	Allocation
Confusion	Thousand Peaks	1,320 aums
	Coyote Knolls	98 aums
	Gandy	120 aums
	Tule Valley	96 aums
	Total	1,644 aums
Swasey	Antelope	276 aums
	Cowboy Pass	0 aums
	Tatow	864 aums
	Swasey Knolls	0 aums
	Total	1,140 aums

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

- | | Implementation | Monitoring | Modification |
|---|--|------------|--------------|
| 4 | Initiate and compile inventory/monitoring studies to more precisely determine the following characteristics of the herds and their habitat: | | |
| | <ul style="list-style-type: none">• Accurate Population Numbers• Age and Sex Ratio• Social Structure• General Physical Conformation and Condition of Animals | | |
| 5 | Approximately 25 to 30 head of horses are presently using the Partoun Allotment. These are apparently wild horses encroaching from a contiguous HMA. The Partoun Allotment is not a recognized HMA and no forage has been, or will be, allocated to horses. These horses will be removed as quickly as possible. | | |
| 6 | Weekend surveillance patrols will be made especially during the spring foaling season to reduce harassment of wild horses during this critical period. | | |

SUPPORT REQUIREMENTS

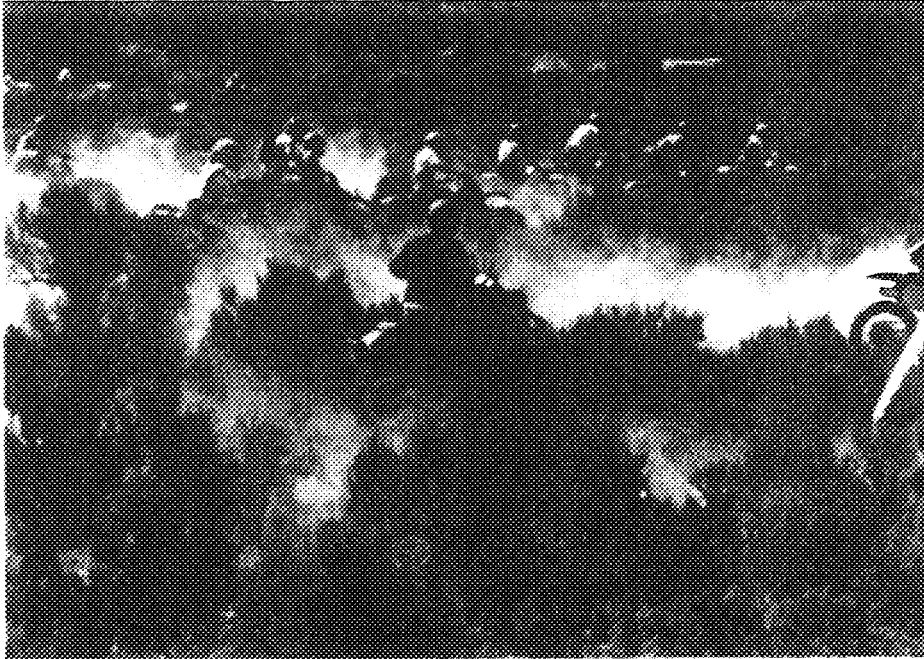
In order to control encroachment of horses across the Utah-Nevada border approximately 13 miles of fence would be maintained or modified.

PLAN MONITORING AND EVALUATION

This plan will be monitored each year to determine which items need to be brought forward into the annual work plan.

Populations will be determined on an annual basis by ground or aerial surveys, depending on availability of funds. Vegetation studies established in crucial wild horse areas in 1977 will continue to be read. Utilization of key forage plants used by wild horses will be determined each year. Trend plots established in these areas will be monitored to determine key forage plant trends. This data will be evaluated at periodic intervals to determine if objectives of this RMP and subsequent herd management plans are being met.

Recreation



CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

RECREATION

INTRODUCTION

The HRRA contains a wide variety of recreation resources. The Deep Creek range contains six perennial streams that support fish populations. Birch and Trout Creeks have potential for study and could be included in the National Wild and Scenic Rivers System. Additional areas with significant recreation resources include Yuba Reservoir, Topaz Mountain, Antelope Springs Cave, Gandy Mountain Caves, and Swasey Mountain. Yuba Reservoir, widely known for aquatic sports, has 150,000 visitors per year. Topaz Mountain offers rockhounds some of the finest examples of topaz crystals in the United States, Intensive Off Road Vehicle (ORV) use occurs at the Little Sahara Recreation Area with over 100,000 visitors per Year. Other popular ORV areas include the Deep Creek Mountains, Yuba Dam, Sheep Rock Mountains, Tintic Mountains, and Desert Mountain. A visual resource inventory and analysis has been completed for the entire resource area.

Deep Creek Mountains

The Deep Creek Mountains are noted for outstanding recreational and scenic values. The range is characterized by sheer granite cliffs and glacial cirques at the higher elevations. Recreational and scenic values in the Deep Creek Mountains are currently managed under IMP and the Deep Creek Mountains Management Plan (1975). There is an abundance of plant and animal species.

Several streams in the Deep Creek Mountains provide habitat needed to support remnant populations of the Bonneville cutthroat trout, *Salmo clarki Utah*, which is under status review for possible listing as threatened or endangered and is considered by the bureau as a sensitive species. These streams include: Birch Creek, Trout Creek, Granite Creek, Cottonwood Canyon Creek, Red Cedar Creek, Basin Creek, Indian Farm Creek, and Tom's Creek.

The Bonneville cutthroat trout is the only trout endemic to the Bonneville Basin and was once considered extinct. In its pure form, it is one of the rarest of the subspecies of cutthroat. The Continuing existence of this species is threatened by hybridization with rainbow trout. UDWR has initiated a fish eradication and stocking Program to

reestablish pure strain Bonneville cutthroat trout. There is also concern on all of these streams over the impending loss of habitat due to stream diversion and construction of a small hydroelectric power plant sometime in the future. These concerns are addressed in the Deep Creek Mountains Habitat Management Plan (HMP) (1981).

Rockwell Natural Area

The area consists of large sand dunes deposited along the southern shores of Pleistocene Lake Bonneville. The dunes have developed a unique associated ecology, in response to the specialized homogenous landform material. The most conspicuous plant growing on the dunes is the large four-wing salt bush *Atriplex canescens gigantea*. This species was recently (1985) added to the U.S. Fish and Wildlife Service (FWS) list as a Category 2 Candidate (sensitive) species under review. It frequently grows to a height of 8 to 10 feet and 10 to 15 feet across. This giant form of four-wing is found nowhere else in the world. It appears to be the last remaining relic of a once wide spread population which has now become extinct everywhere except on this sand dune island.

Management prescriptions for the Rockwell Natural Area are contained in the Little Sahara Management Plan (1979). This plan identifies uses incompatible with the natural environment: vehicle use, camping, campfires, and removal of plant or animal materials.

Gandy Mountain Caves

Gandy Mountain contains two known limestone solution caverns: Crystal Ball Cave and Gandy Mountain Cave. Both caverns remain in relatively pristine condition since their discovery in the late 1950s.

Crystal Ball Cave consists of a large cave avenue oriented along joint fractures approximately 700 feet long. Artificial entrances have been excavated at each end of the cave and walkways for visitors have been installed. The cave is named for its extensive crystalline deposits of dog tooth spar, Icelandic spar, helictes, and other speleothemic deposits. Only a few other limestone caverns are known to exist anywhere in the world with this type of mineral deposition. Numerous species of Pleistocene mammalian bones have been collected from the cave sediments. Gandy

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

Mountain Cave probably originated from the same joint system as Crystal Ball Cave and it contains numerous well-formed dripstone formations in its terminal room.

Currently, there are mining claims on Crystal Ball and Gandy Mountain Caves. Although the claimant has a strong conservation ethic, this claim provides the legal prerogative to mine the cave for its unique mineral deposits. Although the cave presently has two locked doors protecting access into each entrance, there is an on-going potential of vandalism of the fragile mineralization. Cave mineral deterioration may be currently occurring because of apparent interruption of normal ground water flow.

ELEMENTS OF THE PLAN

Goals and Objectives

Goals and objectives of the HRRR recreation program are to: (1) provide recreation opportunities under BLM's basic stewardship responsibilities for unstructured and structured recreational uses; (2) maximize visitor freedom of choice; (3) continue management of important recreational resources in Federal ownership, to preserve those values, and make them available for appropriate recreation enjoyment by the public.

PLANNED ACTIONS

Visual Resource Management (VRM)

- 1
 - Re-evaluate and change, if necessary, the VRM classes in the area burned near Little Sahara.
- 2
 - Environmental conditions are constantly changing due to uncontrolled natural causes. (e.g., fires, erosion, etc.). Therefore, VRM classes will be re-evaluated every three to five years to determine if class changes are necessary. See Map 5 for VRM areas.



Implementation

Monitoring

Modification

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

		Implementation	Monitoring	Modification
	Special Management Designation			
3	<ul style="list-style-type: none">• The following areas will be Special Recreation Management Areas (SRMAs) and are listed in priority:<ol style="list-style-type: none">a. Little Sahara Recreation Areab. Deep Creek Mountainsc. Swasey Mountainsd. Gandy Mountain Cavese. Yuba Reservoirf. Topaz Mountain Rockhounding Areag. Antelope Springs Caveh. Sheeprock/Tintic ORV area			
4	<ul style="list-style-type: none">• The following areas will receive ACEC designation:<ol style="list-style-type: none">a. Gandy Mountain Caves ACECb. Deep Creek Mountains ONA/ACECc. Rockwell Natural Area ONA/ACEC			
5	<ul style="list-style-type: none">• An ACEC activity plan will be prepared for those areas containing values at risk.			
6	<ul style="list-style-type: none">• Other significant sites where other actions will be taken to preserve or support recreation values:<ol style="list-style-type: none">a. Baker Hot Springsb. Fumarole Buttec. Paul Bunyan's Woodpile			

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

Implementation

Monitoring

Modification

Off Road Vehicle (ORV) Designations

ORV designations will be the top priority for the HERRA Recreation program. Specific actions, to be prepared in an implementation plan, are listed below in priority order.

- 7 • Little Sahara Recreation Area and Vicinity
 - a. ORV use in the Little Sahara Recreation Area would continue to be limited (i.e., restricting ORV use to roads and limiting speeds within campgrounds) on 2,782 acres and closed on 9,604 acres (Rockwell Natural Area).
- 8 b. The remaining portions of Little Sahara Recreation Area and adjoining lands would be established as a competitive events area, subject to present management. Limitations on ORV use in these areas would be required during periods of livestock and wildlife use to protect rangeland, wildlife, and other values (i.e., adjust dates of events, locations, amount of use, etc.). Allotments affected would include Cherry Creek, Death Canyon, Desert Mountain, Maple Peak, Meadow Creek, Riverbed, Sheep, Sheeprock, Sugarville, and the portions of McIntyre and Shearing Allotments outside Little Sahara (415,630 acres). The locations and conditions of roads and trails would be inventoried and monitored.
- 9 c. Three- and four-wheel All Terrain Vehicle (ATV) use would be allowed only on sand dune terrain, existing roads, and specially designated trails.
- 10 • 30,700-acres of the Deep Creek Mountains would be closed and 64,969-acres limited to existing roads and trails would continue.
- 11 • ORV use on Swasey Mountain (34,500 acres) would be limited to existing roads, ways, and trails.
- 12 • The sand dunes between the DMAD Reservoir/Oak City would be established as an ORV use area with special emphasis on ATVs.
- 13 • ORV use at Yuba Dam (1,650 Acres) would be limited to existing roads and trails.

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

Implementation

Monitoring

Modification

RECREATION RESOURCE MANAGEMENT

The following recreation areas are listed in order of priority. The specific management actions are also listed in order of priority. Changing conditions and future funding, however, may necessitate an adjustment in those priorities. Map 6 shows special management areas and ORV designations.

Little Sahara Recreation Area

- 14 Update the Little Sahara Recreation Management Plan. Emphasis in the plan will be :
- Campground Use and Maintenance
 - User Fees
 - Safety
 - ORV Trails and Management
 - Public Relations
 - Use Patrol
 - Visitor Center Complex
 - Access
 - Land Tenure Adjustment
 - Livestock Grazing
- 15 Implement critical action items in the current Little Sahara Recreation Management Plan. The following is a prioritized list of these items:
- Reroute and pave the White Sands Campground access road.
 - Close the north entrance to the Little Sahara Recreation Area.
 - Provide permanent housing for staff.
 - Install support facilities at Sand Mountain (such as permanent restrooms, water faucets, etc.).
 - Construct the second phase of White Sands Campgrounds.
 - Provide adequate staffing through permanent, temporary and volunteer assistance.
 - Construct additional campgrounds as needed.

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

Implementation

Monitoring

Modification

Deep Creek Mountains

- 16
 - Develop a recreation activity plan if not designated wilderness. This would include the following:
 - a. Campgrounds
 - b. Visitor Information Center
 - c. Trail Heads
 - d. Staging Areas
 - e. Improve Road and Trail Access
- 17
 - Designate 30,700 acres as ONA/ACEC.

Swasey Mountain

- 18
 - ORV use on Swasey Mountain (34,500 acres) would be limited to existing roads, ways, and trails.
- 19
 - Maintain access to, and construct minimal support facilities at, the Sinbad Overlook,
- 20
 - Install an interpretive and warning sign.
- 21
 - Provide safety measures at the Sinbad Overlook.

Gandy Mountain Caves

- 22
 - Designate Gandy Mountain Caves as an ACEC (1,120 acres).
- 23
 - Prepare an ACEC activity plan and emphasize the following items:
 - a. Recreation Use
 - b. Validity Determination of Mining Claim
 - c. Cooperation Plan for Visitor Management
 - d. Access and Trails
 - e. Protection
 - f. Caves Use Enhancement and Safety (Visitor Services)
 - g. Advertising and Promotion
 - h. Identify an On-Site Manager
- 24
 - Initiate a mineral withdrawal on 1,120 acres.
- 25
 - Expand present oil and gas leasing Category 3 to 1,120 acres.

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

		Implementation	Monitoring	Modification
	Yuba Dam Reservoir (Sevier Bridge Reservoir)			
26	<ul style="list-style-type: none">• Inventory visitor use patterns, including seasons, numbers, locations, and needs.			
27	<ul style="list-style-type: none">• Coordinate with U.S. Bureau of Reclamation for allocation of Central Utah Project Impact Funds for Yuba Reservoir:<ul style="list-style-type: none">a. Funding for implementation of the recreation plan with particular emphasis on:<ol style="list-style-type: none">1. Survey & Design of Facilities2. Recreation Construction3. Recreation Maintenance4. Land Tenure Adjustments			
28	<ul style="list-style-type: none">• Update and implement the recreation plan to manage and enhance the recreational resources available. Items of particular concern are:<ul style="list-style-type: none">a. Recreational Use Facilitiesb. Sanitation (to include sanitation contract)c. Water Safetyd. Cooperation with the Utah Division of State Parks in accordance with the Memorandum of Understanding (MOU)e. User Feesf. Use Patrolsg. ORV Supervision Use and Restrictions and Monitoringh. Land Patterns (Land tenure adjustment)i. Administrative Site			
	Topaz Mountain Rockhounding Area			
29	<ul style="list-style-type: none">• Develop and implement a recreation activity plan for the Topaz Mountain Rockhounding Area. Items to be included are:<ul style="list-style-type: none">a. Acquisition of State Landsb. Improvement of Accessc. Recreational Facilitiesd. Sanitatione. Resolution of Claim Validityf. Withdrawalsg. Safetyh. Visitor Managementi. Signing and Interpretation			

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

- | | Implementation | Monitoring | Modification |
|------------------------------|--|------------|--------------|
| 30 | <ul style="list-style-type: none">• Continue present minerals segregation, no shooting restriction, and use of hand tools only. | | |
| Antelope Springs Cave | | | |
| 31 | <ul style="list-style-type: none">• Prepare a recreation activity plan and emphasize the following items:<ul style="list-style-type: none">a. Cooperative Management Agreement with National Speleological Societyb. Restore Cave to a Natural Condition (remove graffiti trash)c. Emergency Rescue and Safety, Co-operative Management Agreement (CMA) with County Sheriffs Officed. Resource Protection and Interpretatione. Visitor Managementf. Improve Access and Support Facilities | | |
| Rockwell Natural Area | | | |
| 32 | <ul style="list-style-type: none">• Designate 9,630 acres as Outstanding Natural Area/Area of Critical Environmental Concern (ONA/ACEC). | | |
| 33 | <ul style="list-style-type: none">• Initiate mineral withdrawal on 9,630 acres. | | |

SUPPORT REQUIREMENTS

Little Sahara Recreation Area

Assistance will be needed from engineering technicians to help in facility design and layout. The Division of Operations will assist in construction.

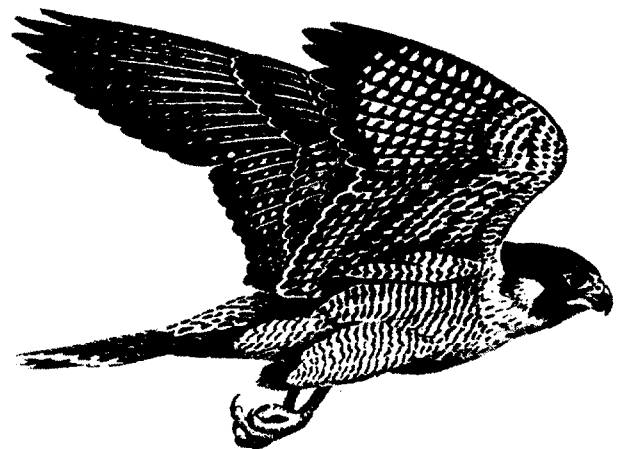
Special assistance will be needed from rangers, special agents and Public Information Specialists during peak visitor use periods.

Yuba Reservoir

Assistance will be needed from engineering technicians to help in facility design and layout. The Division of Operations will assist in construction.

Topaz Mountain Rockhounding Area

A minerals validity examination would be needed to determine mining claim validity.



CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

Other

Support will be needed for mineral withdrawals and changes in oil and gas leasing categories for: The Deep Creek Mountains, Gandy Mountain Caves, Antelope Springs Cave, Swasey Mountain and the Little Sahara Recreation Area.

Program reviews at five-year intervals will assess the progress of the plan accomplishments and any need for modification.

PLAN MONITORING AND EVALUATION

Activity plans for the special management designation areas, and the ORV designations will define monitoring standards and intervals for those areas and activities.



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Cultural Resources



CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

CULTURAL RESOURCES

INTRODUCTION

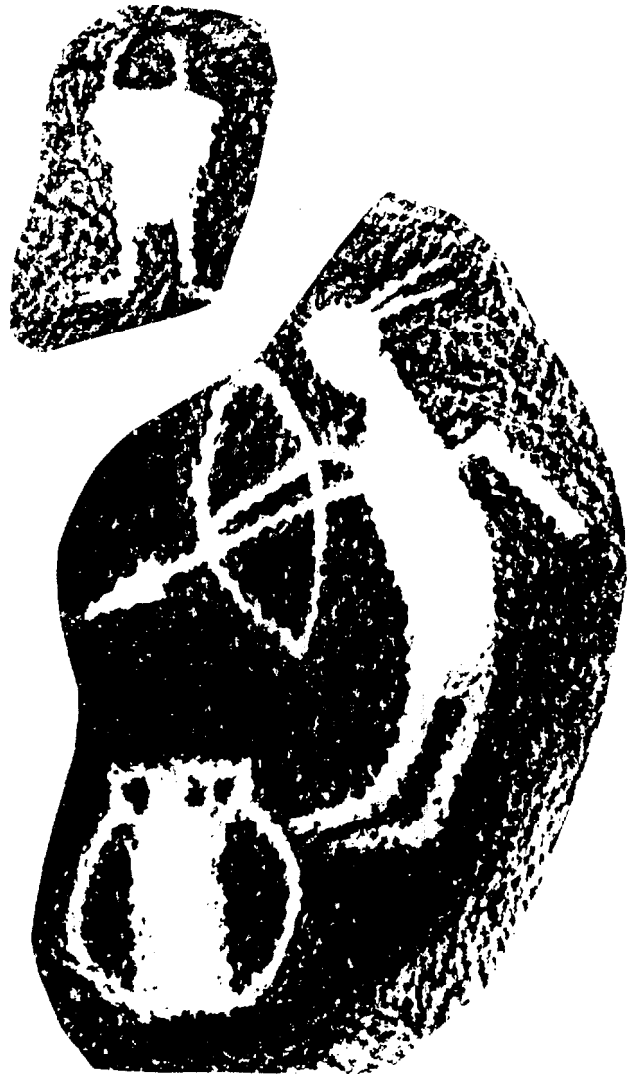
Utah's western desert has been host to sporadic human activity for almost 14,000 years. The HRRRA is known to have at least four distinctive prehistoric cultures represented: Paleo-Indian, Desert Archaic, Fremont, and Piute-Shoshone groups. Historic activity in this area consisted mostly of a few exploratory surveys (Dominguez-Escalante, Gunnison, etc.) the Pony Express, Civilian Conservation Corps (CCC) reclamation projects, mining, and ranching. The following are the types of sites found in the resource area:

- Sites listed on the National Register of Historic Places (NRHP):
 - Fish Springs Caves Archaeological District
 - Pony Express Trail
 - CCC camps near Antelope Springs, Tom's Creek, and Kane Springs
- Sites having qualities giving them the potential for nomination to the NRHP. To date, approximately 319 cultural sites have been identified within the area. About 20% of the sites have the qualities to make them eligible for nomination to the NRHP.
- Sites that do not meet the criteria for nomination to NRHP.

ELEMENTS OF THE PLAN

Goals and Objectives

Protect the cultural and historic values in the planning area from accidental or intentional destruction and give special protection to cultural sites having potential for the NRHP.



CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

PLANNED ACTIONS (LISTED IN ORDER OF PRIORITY)

Implementation

Monitoring

Modification

- 1
 - Ensure that both BLM and non-BLM actions avoid damage to cultural resources so as to protect and preserve them for the benefit of scientific and educational use by present and future generations.
- 2
 - Perform predictive cultural resource inventories.
- 3
 - Prepare a Cultural Resource Activity Plan which will identify ways to enhance the historic and educational value of the Fish Springs Archaeological District.
- 4
 - Evaluate the Joy Townsite for eligibility on the NRHP.
- 5
 - Evaluate the Pony Express Trail to determine inclusion into the National Trail System.

SUPPORT REQUIREMENTS

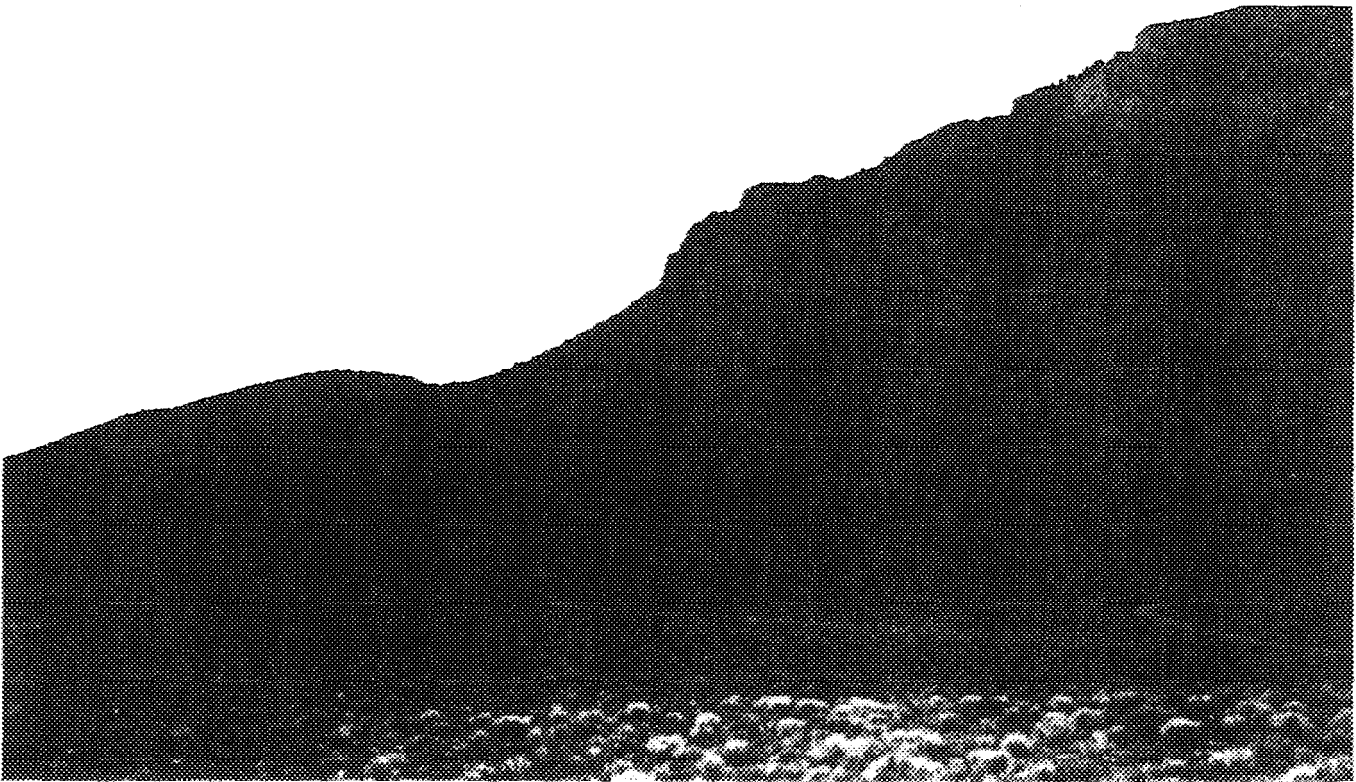
In order to accomplish the predictive inventories, it will be necessary to either hire temporary help or budget for contract inventories.

PLAN MONITORING AND EVALUATION

At least every five years the cultural resources program will be monitored and evaluated to determine its effectiveness in meeting the goals and objectives.



Lands



CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

LANDS

INTRODUCTION

The lands program is characterized primarily by the processing of several rights-of-way applications and temporary land use permits each year. Periodically, work is also done on desert land entries, exchanges, withdrawals, and Recreation & Public Purpose Act (R & PP) leases. The lands program also provides support to other activities through processing special land designations.

ELEMENTS OF THE PLAN

Goals and Objectives

The objectives of the lands program are to provide effective public land management and to improve land use, productivity, and utility through: (1) accommodation of community expansion and economic development needs; (2) improved land ownership patterns; (3) providing for the authorization of legitimate uses of public lands by processing use authorizations, such as rights-of-way, leases, permits, and state land selections in response to demonstrated public needs; and (4) assist in orderly resource management through special designations. Map 7 shows Areas of Critical Environmental Concern (ACEC) and rights-of-way corridors.

PLANNED ACTIONS

Land Tenure Adjustments

- 1 Prior to any adjustment in land tenure on the 2,245,314 acres of public land in the HRRRA, conformance with the land use plan will be determined. Procedures to be followed will be as defined in the ELM Manual and regulations, in accordance with the type of land tenure adjustment.



Implementation

Monitoring

Modification

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

	Implementation	Monitoring	Modification
2	After a Land Report/Environmental Assessment (LR/EA) has been completed and a decision made that determines that a parcel is suitable for sale or exchange and would benefit the public, a Notice of Realty Action (NORA) will be published in the Federal Register and a local newspaper for three weeks. State and local government officials, appropriate Congressional committees and representatives, adjacent landowners, and interested parties will be notified by a direct mailing of the NORA.		

3 The NORA will detail the proposed realty action including restrictions on any title, deed, or lease issued. The disposition of grazing rights, minerals, or surface use rights and the fair market value of the parcel of public land will be defined. The NORA will precede a 45 day public comment period.

Public Sale

4 Since no lands have been identified for sale, disposal of any public lands by sale will require an amendment of the Resource Management Plan (RMP).

Exchange

5 The following lands are identified for acquisition by the U.S. through (exchange):

Salt Lake Base and Meridian, Utah

T. 11 S., R. 18W.

Sec. 3, S $\frac{1}{2}$

Sec. 4, S $\frac{1}{2}$

Sec. 5, Lots 1,2,3,4, S $\frac{1}{2}$ N $\frac{1}{2}$ S $\frac{1}{2}$

Sec. 6, SE $\frac{1}{4}$ SE $\frac{1}{4}$

Sec. 7, NE $\frac{1}{2}$ SE $\frac{1}{2}$

Sec. 8, All

Sec. 9, All

Sec. 17, W $\frac{1}{2}$ SW $\frac{1}{2}$.

Sec. 18, W $\frac{1}{2}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$, S $\frac{1}{2}$

Containing 3,210.2 acres

These are the private lands (Parrish Estate) proposed for acquisition by the U.S. as part of The Nature Conservancy Exchange, U-56998. Acquisition or disposal of any other lands as part of a land exchange will require an amendment of the RMP.

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

Implementation Monitoring Modification

Rights-of-Way Corridors

- 6 Section 503 of the Federal Land Policy and Management Act (FLPMA) states:
- 7 ". . . Utilization of rights-of-way in common shall be required to the extent practical . . ." The utilization of existing corridors, whether designated or not, will be standard procedure.
- Rights-of-way will be processed on a case-by-case basis, generally in the order received.
- 8 Existing major rights-of-way are designated as corridors (see Table 2-4). New rights-of-way will be restricted,

TABLE 2-4

Name	Corridor Width (ft.)	Specifications	Term*
IPP to Nevada Transmission Line	1,500	Available for all utility uses.	4,7
IPP to California d.c. Transmission	1,500	Available for all utility uses.	4,1
U.S. Highway 50&6	2,000	Available for all uses.	1,2,3,8
IPP to Mona, Utah	1,500	Available for all utility uses.	4,1
Mona North and South Transmission Lines	1,500	Available for all utility uses.	4,1
Interstate 15	3,000	Available for all uses.	6,8

*** Terms:**

1. The road or highway within the rights-of-way corridor shall be used to the maximum extent possible for construction and maintenance of new rights-of-way.
2. Road that are needed for, construction of a new rights-of-way shall be temporary and fully rehabilitated.
3. All land disturbed by new right-of-way, except authorized new access roads, shall be rehabilitated to as close to natural conditions as possible
4. Transmission line rights-of-way shall be adjacent to each other or located as close as possible.
5. Buried telephone cable lines shall be close to existing roads and highways and generally within the road rights-of-way.
6. New right-of-way shall be limited to below the surface of the ground uses only.
7. Existing transmission line access roads shall be used, and only the roads to new tower sites shall be constructed for new rights-of-way.
8. All rights-of-way must comply with the applicable Visual Resource Management (VRM) Class guidelines.

Segregations

- 9 Public lands may be removed from the operation of the public land laws, including the mining laws, to allow for orderly administration. Segregations in the HRRRA will be in the form of withdrawals and classifications.

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

Withdrawals

Implementation

Monitoring

Modification

- 10 Withdrawals are initiated to limit use and protect special resource values or improvements on public lands. Existing HERRA withdrawals with varying segregations are: Little Sahara Recreation Area (campground), Goshute Indian Reservation, Fish Springs National Wildlife Refuge, Uinta National Forest, Fishlake National Forest, Wasatch National Forest, public water reserves, the Topaz Lake Wildlife Conservation Area, public water reserves, and power site reserves. These withdrawals will be continued.
- 11 Withdrawals with appropriate segregations will be initiated for all or a portion of the Rockwell Natural Area, Topaz Mountain, Dugway Geode Beds, and Gandy Mountain Caves.

Land Classification

- 12 Classification under the Classification and Multiple Use Act (C&MU) will remain effective on the following sites until alternative protective designation or stipulation can be implemented. Currently all these sites are segregated against all agricultural, land laws, sales, and location and entry under the mining laws:
- Fish Springs Pony Express Station
 - Black Rock Pony Express Station
 - Dugway Pony Express Station
 - Boyd Pony Express Station
 - Toms Creek
 - Dugway Geode Bed
 - Topaz Mountain
 - Paul Bunyan's Woodpile
 - Baker Hot Springs
 - Public Water Reserves
 - Power Site Classifications and Reserves
 - Oil Shale Withdrawal

Special Management Concerns

- 13 Areas identified through the land use planning process as needing special management designation, including ACECs, are designated and will be managed in accordance with pertinent BLM policy, regulations and legislation. Many of the management actions described are not the responsibility of the lands program. The nominating programs have lead responsibility for accomplishment of management actions.

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

Areas of special management concern are found on Table 2-5.

TABLE 2-5

HRRR AREAS OF SPECIAL MANAGEMENT CONCERN

Area	Management Designation	Acres	Oil/Gas Category	Acres	Mineral Withdrawal	Acres
Rockwell Natural Area	ONA/ACEC*	9,630	CATEGORY 4	9,630	Yes	9,630
Gandy Mt. Caves	SRMA/ACEC	1,120	CATEGORY 3	1,120	Yes	1,120
Deep Creek Mts.	ONA/ACEC, SRMA **	30,740	CATEGORY 3	30,740		
Antelope Springs Cave	CLASS III RA, SRMA	150	CATEGORY 4	150		
Dugway Geode Beds		2,284			Yes	2,284
Paul Bunyan's Woodpile	CLASS III WA	338	CATEGORY 3	338		
Topaz Mt. Rockhounding Area	CLASS III RA, SRMA				Yes	
Joy Townsite			CATEGORY 3	80		
Swasey Mts.	SRMA		CATEGORY 4	29,840		
			CATEGORY 3	19,660		
Sheeprock/Tintic ORV Area	SRMA					
Yuba Reservoir	SRMA		CATEGORY 3	80		
Little Sahara Recreation Area	SRMA **		CATEGORY 4	12,650	Yes	3,500
Sevier Bridge Reservoir (Yuba Dam)			CATEGORY 3	80		
Baker Hot Springs			CATEGORY 2	160		
Fumarole Butte			CATEGORY 3	160		
Least Chub			CATEGORY 4	3,360		
Riparian Habitat			CATEGORY 3	2,500		
Critical Watershed			CATEGORY 2	10,800		
Gunnison Bend Reservoir			CATEGORY 2	80		
DMAD Reservoir and Sevier River			CATEGORY 2	2,600		
Topaz Migratory Bird Refuge			CATEGORY 2	3,360		
Deer and Elk Winter Range			CATEGORY 2	17,140		

* Part of the Little Sahara Recreation SRMA

** Continuation of current SRMAs

SUPPORT REQUIREMENTS

The following support will be required to achieve management objectives outlined for the lands program: clerical, land appraisals, mineral examinations, and site specific resource evaluations by appropriate staff specialists.

Program coordination between the lands program and other programs will be administered through the normal NEPA and LR process

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

Land Tenure Adjustment

As land ownership changes, livestock grazing capacity determinations will need to be made and adjustments made accordingly. Land acquired through exchange from The Nature Conservancy (Parrish estate) will be annexed to the Deep Creek Mountain WSA or ONA/ACEC. Requests for appraisals will be made through State Office staff.

Tresspass

Cadastral survey may be required on occasion to accurately identify land ownership.

Withdrawal

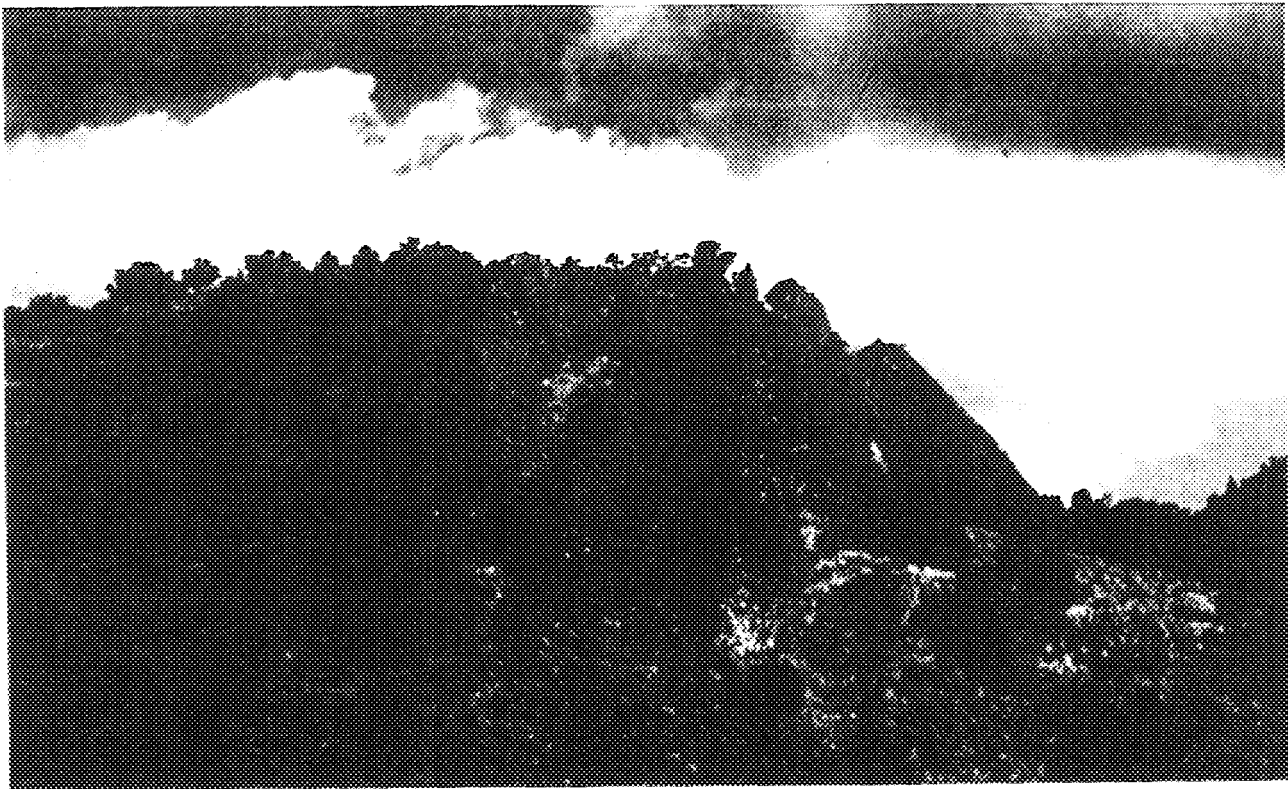
Permission to proceed and actual approval for withdrawals remain a Washington Office (WO) level function. Support will be required at the State and WO level.

PLAN MONITORING AND EVALUATION

Formal monitoring reviews will be conducted at intervals not to exceed five years. These reviews will assess the progress of plan implementation and the need for amendment or revision.



Minerals



CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

MINERAL RESOURCES

INTRODUCTION

The resource area has a speculative to very low potential for oil and gas resources, with the areas of highest potential being located in the eastern portion of the resource area. Geothermal resource potential ranges from moderate to low. The areas of moderate mineral potential include those areas in and around the Crater Springs KGRA, the Drum Mountains, and those areas delineated as being prospectively valuable for geothermal resources by the BLM. Locatable mineral resource potential ranges from low to high for precious, base and industrial minerals. Areas of high locatable mineral resource potential are located primarily within the mountain ranges. Saleable mineral resources occur throughout the HRRRA. Areas of greatest use of these commodities occur near more populated areas. Commercial and hobby collection of mineral specimens and gemstones also occurs throughout the resource area.



ELEMENTS OF THE PLAN

Goals and Objectives

The goals of the minerals program are to: (1) provide for exploration, development, and use of minerals on public land consistent with applicable laws and regulations; (2) require the least restrictive stipulations necessary to adequately protect other resources; and (3) continue to meet public demand for saleable and free-use mineral materials on a case-by-case basis.

PLANNED ACTIONS

Geothermal

- 1 Offer over-the-counter leases on all areas with the fluid mineral leasing Categories 1, 2, & 3 except for Known Geologic Resource Areas (KGRAs). Map 8 shows locations of geothermal resources.
- 2 Offer by competitive sealed bids, all unleased, cancelled, expired, or otherwise terminated lease areas within KGRAs.

Implementation

Monitoring

Modification

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

Oil and Gas

Implementation

Monitoring

Modification

- 3 Lease, by non-competitive procedures, all areas within fluid mineral leasing Category 1, 2, and 3. In the event that oil or gas resources are discovered within the resource area, leases could be issued on a competitive basis within established Known Geologic Structures (KGS s) in accordance with the leasing category system set forth in the plan. Map 9 shows oil and gas categories and locatable minerals. The following special management areas are protected by oil and gas leasing categories:

TABLE 2-6

Name of Area	Category	Acreage
Rockwell Natural Areas	4	9,630
Gandy Mountain Caves	3	1,120
Deep Creek Mountains	3	30,740
Antelope Springs Cave	4	150
Paul Bunyan's Woodpile		320
Joy Townsite		80
Swasey Mountains	4	29,840
	3	19,660
Yuba Reservoir	3	80
Little Sahara Recreation Area	4	12,650
Sevier Bridge Reservoir (Yuba Dam)	3	80
Baker Hot Springs	2	160
Fumarole Butte	3	160
Least Chub	4	3,360
Riparian Habitat	3	2,500
Critical Watershed	2	10,800
Gunnison Bend Reservoir	2	80
DMD Reservoir and Sevier River	2	2,600
Topaz Migratory Bird Refuge	4	3,360
Deer and Elk Winter Range	2	17,140

Locatable Minerals

- 4 The following areas are or will be segregated from all mineral entry:

TABLE 2-7

AREAS SEGREGATED FROM MINERAL ENTRY

Name of Area	Acreage
Rockwell Natural Area	9,630
Topaz Wildlife Conservation Area*	4,142
Topaz Mountain	1,600
Dugway Geode Beds**	2,284
Gandy Mountain Caves	1,120
Little Sahara Recreation Area	3,500

* Existing Withdrawal

** Existing CMU Classification

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

- | | Implementation | Monitoring | Modification |
|---|---|------------|--------------|
| 5 | The entire resource area, except for those areas withdrawn, will remain open for mining claim location. Plans of operations are required for all activities with the exception of casual use within Areas of Critical Environmental Concern (ACECs). (See the Lands Section). | | |

Saleable Minerals

- 6 The entire resource area will be open to mineral disposal on a case-by-case basis except for those areas identified as oil and gas leasing Categories 3 & 4 .
- 7 The entire resource areas is open to hobby collection of invertebrate fossils and mineral specimens.

SUPPORT REQUIREMENTS

Oil and Gas

Sufficient personnel must be provided to process Applications for Permit to Drill (APDs) and Notices of Intent (NOIs) to conduct geophysical exploration operations within required time frames.

Geothermal

Sufficient personnel must be provided to process geothermal drilling permits, plans of operation, and NOIs to conduct geophysical exploration in the required time frames. Personnel must also be provided to monitor the surface and subsurface use of the resource.

Locatable Minerals

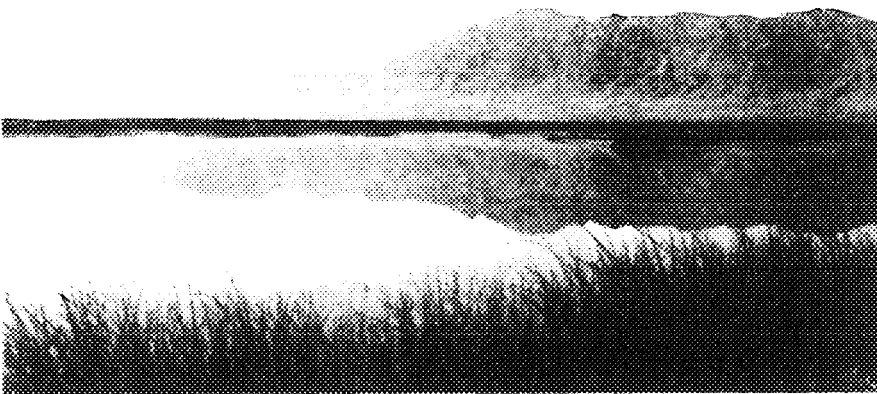
Locatable mineral activity is nondiscretionary and is regulated by 43 CFR 3800. Personnel must be provided to assure that activities are conducted in a manner which prevents undue or unnecessary environmental degradation.

NOIs and plans of operation are required as follows:

- NOI
- Any surface disturbance except casual use
- Plans of Operation
- Any surface disturbance in ACECS, Wilderness Study Areas (WSAs), Closed Off Road Vehicle (ORV) areas, etc.

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Watershed



CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

WATERSHED

INTRODUCTION

The HRRRA is located in the Great Basin Hydrological Region. The area has 11 perennial streams including the Sevier River. Also, there are approximately 140 springs (3,840 acre-feet per year capacity) and seeps, 49 wells, and 49 reservoirs (98 acre-feet capacity). Spring water generally contains calcium bicarbonate or calcium chloride, while well water generally contains sodium chloride or sodium bicarbonate. No water quality data has been collected from reservoirs. Forty-three allotments in the resource area have been identified as having non-point source water pollution from soil loss under the criteria of Section 208 of the Federal Water Pollution Control Act.

Aquifers for the resource area are in three drainage basins: Southern Great Salt Lake Desert, Sevier Desert, and Sevier River.

Certificates or diligence claims are being obtained for water sources.

Water uses include irrigation, industrial, livestock, riparian, wildlife, and culinary.

Several vegetation treatment practices are commonly used for watershed improvement. Methods used in the HRRRA include chaining, burning, disc plowing, and pipe harrowing. Successful seedings have been established in many of the sagebrush and pinyon-juniper associations. See Map 10 for areas suitable for revegetation. This has allowed the land to be seeded to species that afford better soil protection. About 63,022 acres have been seeded, and approximately 89,000 additional acres have good seeding capabilities.

Soils of the HRRRA are found in desert basins and on parallel mountain ranges located in the Great Basin portion of western Utah. Approximately three percent of the resource area is high mountain, steep, containing well-drained soils on mountains and foothills in the humid climate zone. About five percent is very steep sites with rock outcrops on mountain sides in the moist sub-humid climate zone. About 12 percent is upland, well-drained, level to steep soils on mountain slopes, colluvial and alluvial fans in the dry sub-humid climate zone. About 35 percent is semi-desert well-drained, level to steep soils on hills,

lake terraces, alluvial fans in a semi-arid climate zone. About 45 percent is desert, well-drained to excessively drained, level to steep soils on hills, lake terraces, and alluvial fans in an arid climate zone.

GOALS AND OBJECTIVES

- Improve watershed conditions on areas identified with significant erosion condition problems and on other sensitive watershed and riparian areas.
- Avoid deterioration or improve watershed conditions on all other public lands.
- Assure an adequate supply of water for existing and proposed BLM management activities.
- Ensure production of quality water as required by state and federal legislative acts and regulations for on-site and downstream users.
- Coordinate with the proper local, state, and federal authorities on water-related issues.



CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

PLANNED ACTIONS

Implementation

Monitoring

Modification

Watershed

- 1 Establish new, or continue existing, monitoring studies for: soil losses, channel erosion, and vegetation encroachment on the following problem allotments. A plan for possible remedial action will be prepared.

Maple Peak

Fool Creek #1

Oak City

Beryllium

McIntyre

West Mona

Nephi Bench

Sevier River

Rocky Ford

Shearing

Gilson

Valley Mountain

North Scipio

Jake's Canyon

Fool Creek #2

Finlinson

Sugarville

Sand Pass

Paint Mine

See Appendix 3

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

Water

Implementation

Monitoring

Modification

- 2 Continue to inventory and upgrade data on all water sources to provide the following information:
 - Location
 - Type of Water
 - Water Quantity
 - Water Quality
 - Public Needs
 - Current Status of Water Rights Appropriation
 - Public Water Reserve Identification
- 3 Continue to collect and refine soil surface data.

SUPPORT REQUIREMENTS

Division of operations support would be necessary for design, construction, and contract supervision on certain projects.

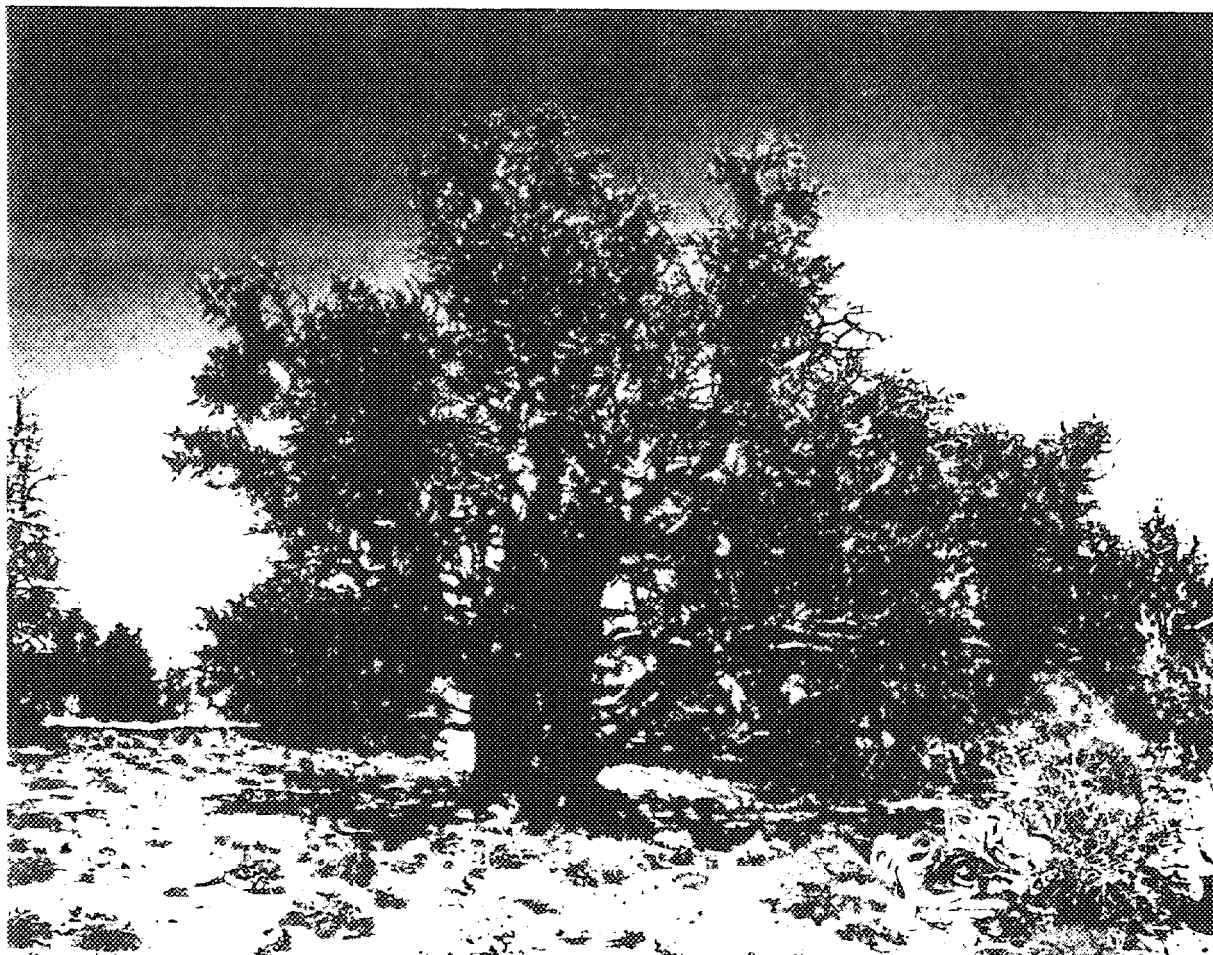
The rangeland and wildlife programs will need to prioritize monitoring to provide livestock and wildlife grazing study data to help determine causes and remedial action for watershed deterioration, and maintain soil loss within acceptable limits where required. If livestock grazing practices, wildlife use patterns, or wild horse uses prove detrimental to watershed values; the rangeland program will need to make necessary adjustments. The range program should provide input to obtain ecological site data.

PLAN MONITORING AND EVALUATION

This plan will be monitored each year to determine which action items need to be brought forward in the Annual Work Plan (AWP).

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Forest Resources



CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

FOREST RESOURCES

INTRODUCTION

Forest resources in the HRRA consist of stands of mixed conifer timber (fir, spruce, pine), aspen, and pinyon-juniper woodlands. Scattered stands of mixed conifers are found at higher elevations in the Swasey Mountains and HRRA portion of the Deep Creek Mountains. These areas also have limited scattered stands of aspen. Throughout the resource area there are extensive areas of pinyon-juniper woodlands on lower mountain slopes and hills. Table 2-8 shows areas containing woodland products:

TABLE 2-8
AREAS CONTAINING WOODLAND PRODUCTS

AREA	Acres	Volume	
		Fuel Wood (cords-)	Post (each)
Keg Mountain	25,000	49,000	125,000
Swasey Mountain	23,000	82,000	20,000
Fish Springs Range	11,000	27,000	6,000
Deep Creek Mountains	17,000	63,000	11,000

¹Other areas (Thomas, Confusion, and Middle ranges, Drum Mountain, etc.) also contain significant, though predominantly scattered, volumes of woodland resources; however, no inventory of those areas has yet been conducted.

Although no inventory has been done, the total volume of timber in the HRRA is estimated to be approximately 625 thousand board feet (MBF). Most of the timber resources is on steep slopes (greater than 40 percent) without present access. Only about 15 percent is in areas with current access.

None of the timber resources in the Deep Creek Mountains are considered suitably stocked or located for commercial harvest operations.

ELEMENTS OF THE PLAN

Goals and Objectives

Manage woodland stands to supply woodland products on a sustained basis for fuelwood, posts, pinenuts, and Christmas trees at fair market value. Authorize harvest of woodland products that approximates the biological capability of the stands to replace trees harvested.

Increase the accessibility to and within the stands to more fully utilize woodland stands.



CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

PLANNED ACTIONS	Implementation	Monitoring	Modification
1	<ul style="list-style-type: none">• Wildlife will be considered during plans for timber harvest. Cutting areas, woodland sales, and vegetation treatments will be designed to provide adequate security and cover for wildlife.		
2	<ul style="list-style-type: none">• Forest harvest and associated activities will be planned to minimize visual impacts.		
3	<ul style="list-style-type: none">• Cutting areas, woodland sales, and vegetation treatments will be designed to meet Visual Resource Management (VRM) objectives.		
4	<ul style="list-style-type: none">• Harvest activities could be restricted because of wet soil conditions to prevent soil compaction or rutting.		
5	<ul style="list-style-type: none">• Harvesting on slopes exceeding 45 percent will be restricted to minimize surface disturbance.		
6	<ul style="list-style-type: none">• No clearing will be done within a 100-foot buffer strip on each side of live streams. Selective partial harvest methods could be allowed within this strip. The actual width of the strip could vary, depending on the aspects of specific sites (e.g., slopes, soil condition, and understory vegetation).		
7	<ul style="list-style-type: none">• On crucial/critical wildlife ranges and riparian areas, only selective removal of woodland products or improvement will be allowed.		
8	<ul style="list-style-type: none">• Christmas tree permits issued will be limited to estimated sustained yield capacity in accordance with Federal Land Policy Management Act (FLPMA).		

SUPPORT REQUIREMENTS

Engineering support will be required for the design and construction of access. Fire management support will be needed for management of wildfire.

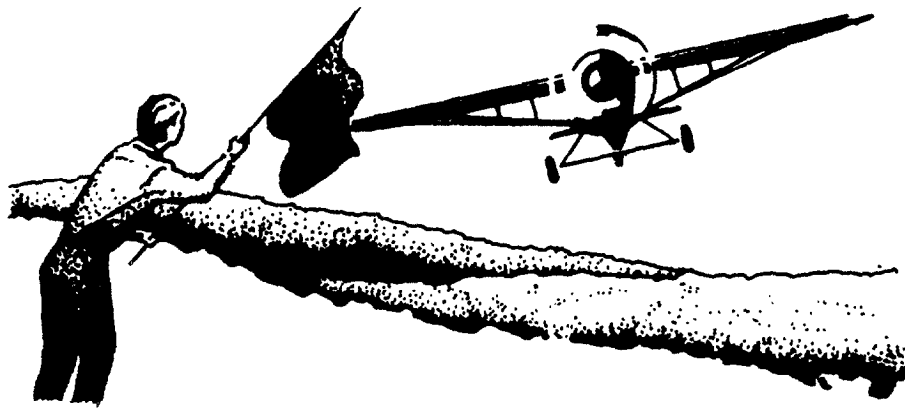
Program coordination with the range, wildlife, and watershed programs will be required in establishing green wood cutting areas, salvage areas, types of harvest methods, and planned results of harvest and mitigation requirements for the activity plan.

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

PLAN MONITORING AND EVALUATION

The forest resources plan elements will be reviewed at five-year intervals to determine if:

- Any measures to facilitate increased utilization of forest resources are warranted.
- Cutting practices are satisfactory or additional mitigation measures (increased monitoring of cutting activities, etc.) are required to protect other resources.
- There are unanticipated on- or off-site impacts.



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Fire Management



CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

FIRE MANAGEMENT

INTRODUCTION

Historically, the fire management practice has been full suppression throughout the resource area. Controlled prescribed fires have been used on a case-by-case basis to convert vegetation types for the benefit of wildlife, livestock, and watershed.

The west half of the resource area has had very few fires. The east half, however, normally experiences large fires annually. Frequently in July, August, and September, there are multiple fire occurrences. The largest fire in recent history occurred in 1981 in the Dust Bowl, Blue Spring, and Red Butte Allotments and exceeded some 17,000 acres. In 1984, the resource area experienced 21 fires which burned 10,676 acres.



GOALS AND OBJECTIVES

The goals and objectives of the program will be to reduce human and ecological losses; complement resource management objectives and sustain productivity of biological systems through fire management.

PLANNED ACTIONS

- 1 A Fire Management Activity Plan will specifically identify and locate areas of full and limited suppression. Full suppression will continue up to 2,156,314 acres.
- 2 Limited suppression will be conducted up to 89,000 acres of pinyon-juniper and possibly other areas.
- 3 Prescribed fire use will be defined in a Fire Management Activity Plan covering the entire resource area. The plan will also address fire attack strategies throughout the resource area, with special attention to high potential, high risk areas.
- 4 Prescribed fire may be used in selected areas to convert vegetation types or meet other management objectives.

Implementation

Monitoring

Modification

CHAPTER 2: THE RESOURCE MANAGEMENT PLAN

- | | Implementation | Monitoring | Modification |
|---|--|------------|--------------|
| 5 | Following wildfire in normal wildfire areas, rehabilitation (chaining and seeding, drilling seed, etc.) will be conducted in accordance with the Richfield District Normal Year Fire Rehabilitation Plan (to be completed in FY 1987). | | |
| 6 | Rehabilitation in other wildfire areas will be assessed and accomplished in accordance with emergency fire rehabilitation plans which will be developed as required. | | |

SUPPORT NEEDS AND PROGRAM COORDINATION

Preparation of the Fire Management Activity Plan will require the support of a fire management planning professional. Support from all resource programs will be required in the development of the management and prescribed fire plans. Program coordination with local fire departments, the State Fire Control Officer, and the U.S. Forest Service in implementing full and limited fire suppression will be required. Prescribed burning will be in compliance with BLM Manual Section 7723, "Air Quality Maintenance Requirements."

PLAN MONITORING AND EVALUATION

The Fire Management Activity Plan and fire management practices will be reviewed at five-year intervals to identify need for revision or modification.



Appendicies



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APPENDIX 1

TOPAZ UNIT (WEST DESERT)

LIVESTOCK/BIG GAME FORAGE USE

ALLOTMENT ¹	KIND	CURRENT LIVESTOCK DATA		CURRENT ESTIMATED DEMAND FOR BIG GAME AND WILD HORSES (AUMs)							ESTIMATED FORAGE CAPACITY (AUMs)				
		PERIOD OF USE		ACTIVE PREF. (AUMs)	AVG. A C T . USE (AUMs)	MULE DEER ²	BIG HORN SHEEP ²	ANTEL ²	WILD HORSES	TOTAL	COMP. FORAGE AVAIL	ADDT' L NON - COMP. BIG GAME FORAGE	TOTAL	INIT. INDI. L/S FORAGE CAP. ³	MGMT. CAT. (MC)
		CURRENT	PROP.												
*Antelope	Cattle	05/01-09/30	Same	99	98	140W	--	38YL	276YL	454	3,277	138	3,415	2,961	M
	Sheep	11/01-04/30	Same	3,956	987										
*Bitner Knoll	Sheep	11/16-04/30	Same	1,995	1,925	35YL		13YL		48	1,754	0	1,754	1,706	M
Boyd Station	Cattle	12/01-05/31	TBD	827	304	10YL		26YL		36	747	0	747	827	M
Callao	Cattle	11/01-06/15	TBD	703	703			19YL		19	660	0	660	703	M
Callao Bench	Cattle	11/01-05/31	Same	747	747	116W	2YL	19YL		137	706	137	843	747	I
Chalk Knolls	Cattle	03/15-09/30	Same	1,213	834			38YL		38	1,182	0	1,182	1,213	M
Cherry Creek	Cattle	03/01-02/28	TBD	1,500	1,378			38YL		38	1,856	0	1,856	1,500	M
Cowboy Pass	Sheep	11/01-04/30	Same	3,108	1,286			38YL	180YL	218	3,160	0	3,160	3,108	M
Coyote Knolls	Sheep	11/01-04/30	Same	2,331	2,034			38YL	48YL	86	2,099	30	2,129	2,331	M
Crater	Sheep	11/01-04/30	Same	3,026	2,449			38YL		38	2,986	0	2,986	3,026	M
*Death Canyon	Cattle	10/25-05/15	Same	1,110	1,070	56W	--	52YL		152	5,605	0	5,605	5,453	M
	Sheep	11/11-05/10	Same	5,028	4,858	44YL	--								
Desert Mtn.	Sheep	11/10-05/09	Same	3,544	1,572	112W	--	52YL		199	3,468	32	3,500	3,544	M
						35YL									
Devils Gate	Sheep	11/01-04/30	Same	306	300			13YL	13YL	13	327	0	327	306	
East Fish Sp.	Cattle	04/15-11/30	TBD	1,107	658	35YL	2YL	26YL		61	1,121	0	1,121	1,107	M
East Topaz	Sheep	12/11-03/31	Same	2,348	1,340	42YL	--	19YL		61	2,369	72	2,441	2,348	M
Flint	Sheep	11/01-04/15	Same	1,467	1,364			13YL		13	1,419	8	1,427	1,467	M
Freighter	Sheep	11/01-04/30	Same	954	958	11W	--	13YL		24	989	34	1,023	954	M
Gandy	Cattle	04/01-12/31	TBD	3,432	1,122			38YL	120YL	158	3,480	17	3,497	3,432	I
Henry Creek	Cattle	04/01-06/30	Same	171	24			6YL		6	205	0	205	171	M
Kane Spring	Sheep	04/01-04/17	Same	303	243			6YL		6	287	0	287	303	M
Knoll Springs	Cattle	05/01-10/31	Same	249	249			6YL		6	249	0	249	249	M
*Lady Laird	Sheep	11/01-04/30	Same	4,830	2,415	56W	--	38YL		94	4,158	0	4,158	4,064	M

APPENDIX 1

TOPAZ UNIT (WEST DESERT)

LIVESTOCK/BIG GAME FORAGE USE

CURRENT LIVESTOCK DATA		CURRENT ESTIMATED DEMAND FOR BIG GAME AND WILD HORSES (AUMs)									ESTIMATED FORAGE CAPACITY (AUMs)				
ALLOTMENT ¹	KIND	PERIOD OF USE		ACTIVE PREF. (AUMs)	AVG. ACT. USE (AUMs)	MULE DEER ²	BIG HORN SHEEP ²	ANTELOPE ²	WILD HORSES	TOTAL	COMP. FORAGE AVAIL	ADD'L NON-COMP. BIG GAME FORAGE	INIT. INDI. L/S FORAGE CAP. ³	MGMT. CAT. (MC)	
		CURRENT	PROP.												TOTAL
*Little Drum	Sheep	11/01-04/30	Same	4,929	1,730	45W		38YL		83	4,419	0	4,419	4,336	M
Marble Wash	Sheep	11/01-04/30	Same	1,290	1,206			26YL		26	1,206	0	1,206	1,290	M
Meadow	Cattle	05/01-05/15	Same	58	58	56W		45YL		101	3,665	52	3,717	3,454	M
Creek	Sheep	11/01-05/10	Same	3,396	3,239										
Mountain	Cattle	07/16-10/16	Same	352	352	214S	1W			298	352	411	763	352	I
Partoun	Cattle	03/01-12/31	TBD	2,185	732	169W	1W	64YL		355	4,260	455	4,715	4,379	M
	Sheep	11/02-04/26	Same	2,194	1,820	121S									
*Riverbed	Sheep	11/02-04/15	Same	4,906	3,122	56W		77YL		157	4,239	327	4,566	4,239	M
*Sand Pass	Sheep	11/01-04/30	Same	2,000	1,141	22W		6YL		28	1,481	79	1,560	1,481	M
Sheep	Cattle	11/01-04/15	TBD	355	203			13YL		13	956	0	956	622	I
	Sheep	04/01-04/30	Same	267	200										
Smelter Mtn.	Cattle	01/01-09/30	TBD	719	719			19YL		19	795	0	795	719	I
Smith Creek	Cattle	11/01-04/30	Same	138	76					0	161	0	161	138	M
Spor Mtn.	Sheep	11/01-04/01	Same	2,750	1,273	71YL		26YL		97	3,256	78	3,334	2,756	M
Sugarville	Cattle	03/16-10/31	TBD	2,959	2,090			13YL		13	3,044	0	3,044	2,959	M
*Swasey Knoll	Sheep	11/01-04/30	Same	4,350	2,649	28W		51YL		79	3,412	0	3,412	3,333	M
*Table M.	Sheep	11/01-04/30	Same	4,048	3,153			51YL		107	3,337	0	3,337	3,230	M
Tatow	Cattle	05/01-09/30	Same	220	220			32YL	864YL	1,436	5,317	166	5,483	4,131	M
	Sheep	11/01-04/30	Same	3,911	1,946										
Thousand	Cattle	10/29-06/09	TBD	8,765	6,160	796YL	44YL	409YL	1,320YL	2,569	21,873	844	22,717	18,511	I
Peaks	Sheep	11/02-05/08	Same	9,746	6,634										
Topaz	Cattle	12/01-04/30	Same	245	61	--				0	245	0	245	245	M
Tule Spring	Sheep	11/01-04/30	Same	1,196	762	--	--	13YL		13	1,084	0	1,084	1,196	M
Tule Valley	Cattle	05/16-10/15	Same	156	120	--			98YL	96	351	0	351	156	M
Trail Herds	Cattle				18YL	--			18		0				
Warm Creek	Sheep	11/01-04/30	Same	522	528	--		19YL		19	522	0	522	522	M
*Wild Horse	Sheep	12/01-04/30	Same	3,577	1,927	22W		51YL	--	98	2,880	109	2,989	2,880	M

APPENDIX 1

TINTIC UNIT (EASTERN FOOTHILLS)

LIVESTOCK/BIG GAME FORAGE USE

CURRENT LIVESTOCK DATA		CURRENT DEMAND FOR BIG GAME							ESTIMATED FORAGE CAPACITY (AUMs)						
ALLOTMENT ¹	KIND	PERIOD OF USE		ACTIVE PREF. (AUMs)	AVG. ACT. USE (AUMs)	MULE DEER ²	ELK	ANTELOPE ²	TOTAL	COMP. FORAGE AVAIL	ADDT'L NON- COMP. BIG. GAME FORAGE	TOTAL	INIT. INDI. L/S FORAGE CAP. ³	POT. ADDT'L FORAGE VEG. TRTMT ⁴	MGMT. CAT. (MC)
		CURRENT	PROP.												
*Beryllium	Cattle	05/01-10/15	Same	666	666			6YL	6	539	0	539	533		M
*Big Hollow	Cattle	03/1 5-06/30	Same	216	0	35YL			35	35	85	110	35	80	
Blue Spring	Cattle	04/01-05/31	Same	180	81	35YL	41YL		76	375	82	457	180		M
Boulter	Sheep	05/01-06/10	Same	723	497	176YL			176	947	284	1,231	723	240	
Broad Canyon	Cattle	11/01-12/31	Same	20	20	35YL	34YL		69	29	68	97	20		
Cals Valley	Cattle	04/01-05/31	Same	72	18	21YL			21	101	26	127	72		M
Cedar Springs	Cattle	07/01-10/28	Same	24	24	44YL			44	24	16	40	24		
Chicken Creek	Cattle	04/01-05/31	Same	48	48		18YL		18	48	7	55	48		M
Chriss Creek	Cattle	06/01-10/28	Same	78	78	18YL	24YL		18	86	23	133	78	110	
Cove	Cattle	11/01-05/15	Same	238	159	52YL			44	229	50	278	238		
Cutler	Cattle	10/16-12/15	Same	32	26	10YL			10	10	6	16	32		
Deer Foot	Cattle	01/10-03/31	Same	54	32	44YL			44	50	54	104	54	100	
Dust Bowl	Cattle	03/15-05/31	Same	916	701	47W	58YL		155	1,651	300	1,951	916	640	
						70YL									
*Ferner Dog Valley	Cattle	08/01-09/25	Same	1,218	1,148	101W	117YL		358	970	817	1,787	970	900	
						157s									
Finlinson 21A	Cattle	05/01-06/30	Same	60	60	26YL	29YL		26	65	65	130	60		
*Fool Creek 1	Cattle	05/16-12/15	Same	72	72	10YL			10	49	0	49	39		C
Fool Creek 2	Cattle	05/16-08/15	Same	16	6	10YL			10	6	0	6	16		C
Garrett	Cattle	11/01-04/30	Same	63	21	10YL			10	35	34	69	63		C
	Sheep	11/01-04/30	Same	1,298	788	121W	137YL	6YL	306	989	597	1,583	986	320	
						175S									
*Jakes Canyon	Cattle	03/16-05/31	Same	113	68	35YL			35	38	37	75	38		
Jenny Lind	Cattle	05/21-10/05	Same	108	108	35YL	6YL		35	118	61	177	108	137	
Juab	Cattle	10/01-12/01	Same	112	0	10YL			10	82	12	94	82	100	
*Kimball Creek	Cattle	06/01-09/21	Same	3,081	2,431	370YL	154YL		498	1,727	711	2,438	1,727	1,100	
						13S									
*Klondike	Cattle	03/15-04/30	Same	60	35	52YL			44	14	37	51	14	49	
Levan	Cattle	04/23-05/22	Same	269	30	38W	41YL		79	552	127	679	269		
Lunt-Latimer	Cattle	04/01-06/15	Same	38	10		23YL		0	46	27	73	38		M
*Lymndyl	Cattle	05/01-10-01	Same	1,676	1,676			6YL	6	575	23	598	575		

APPENDIX 1

TINTIC UNIT (EASTERN FOOTHILLS)

LIVESTOCK/BIG GAME FORAGE USE

CURRENT LIVESTOCK DATA				CURRENT ESTIMATED DEMAND FOR BIG GAME (AUMs)						ESTIMATED FORAGE CAPACITY (AUMs)					
ALLOTMENT ¹	KIND	PERIOD OF USE		ACTIVE PREF. (AUMs)	AVG. ACT. USE (AUMs)	MULE DEER ²	ELK	ANTELOPE ²	TOTAL	COMP. FORAGE AVAIL	ADDIT'L NON-COMP. BIG. GAME FORAGE	TOTAL	INIT. L/S FORAGE CAP. 3	POT. ADDIT'L THRU. VEG. TRTMT ⁴	MGMT. CAT. (M/C)
		CURRENT	PROP.								FORAGE		FORAGE		
*Maple Peak	Cattle	05/21-10/05	Same	5,137	4,973	2078YL			2,078	4,091	2,318	6,409	4,091	3,200	
*Middle Fork	Cattle	04/01-12/31	Same	564	153	44W	47YL		145	259	137	396	251	480	
Mills	Cattle	03/01-04/15	Same	200	200	22W	47YL		69	336	84	420	200		
*Nelson	Cattle	05/01-09/21	Same	521	521			13YL	13	322	0	322	309		
Nephi Bench	Cattle	09/01-10/31	Same	122	37	16W	12YL		16	118	47	165	122		
*North Scipio	Cattle	03/01-02/28	Same	762	333	72YL			72	539	169	708	539	300	
Oak City	Cattle	05/16-08/31	Same	2,205	996	147W			147	1,149	153	1,302	1,149		
*Okelberry	Cattle	05/10-09/30	Same	272	235										
	Sheep	05/01-06/30	Same	589	504	237	110YL		208	819	243	862	619	200	
*Paint Mine	Cattle	04/06-06/05	TBD	545	241	26S			26	216	89	305	216		
Red Butte	Cattle	04/01-06/30	Same	876	392	35YL	53W		88	1,295	78	1,373	876		M
Riley Spring	Sheep	05/01-05/30	Same	144	94	22W			46	179	91	270	144	200	
						24S									
⁵ Rocky Ford	Cattle	05/16-08/15	Same	792	969	35YL			35	976	141	1,117	792	160	
Round Valley	Cattle	12/16-03/31	Same	376	286	62YL	25YL		87	332	99	431	376		I
*Sage Valley 16	Cattle	12/01-05/31	TBD	948	433	28W	35YL		87	525	145	760	525	500	I
*Sage Valley 17	Cattle	11/01-05/15	Same	2,376	1,057	28W	80YL		121	1,376	153	1,529	1,376	400	I
*Salt Creek	Sheep	05/01-06/15	Same	225	225	84W	69YL		298	164	178	342	164		M
						145S									
*Sevier River	Cattle	03/15-11/30	Same	1,066	1,066	70YL			70	601	270	871	601	300	
Shearing	Sheep	04/06-04/30	TBD	1,431	795	140W			89	2,020	974	2,994	1,431	2,400	
Sheeprock	Cattle	05/21-10/05	Same	1,567	1,510	1148YL			1,148	1,456	1,099	2,555	1,567	1,000	
*Snadge Hollow	Cattle	03/15-05/31	Same	77	76	52YL			44	34	61	95	34	80	
*Spring Canyon	Cattle	11/01-07/31	Same	156	114										
	Sheep	05/01-05/15	Same	482	115	123YL	80YL		205	277	210	487	277	300	
'Stone	Cattle	11/012-04/30	Same	120	120	52YL			52	61	54	115	61	140	
Stone Quarry	Sheep	05/01-05/31	Same	225	210	34W	41YL		105	264	178	442	225	300	

APPENDIX 1

TINTIC UNIT (EASTERN FOOTHILLS)

LIVESTOCK/BIG GAME FORAGE USE

CURRENT LIVESTOCK DATA			CURRENT ESTIMATED DEMAND FOR BIG GAME AND WILD HORSES (AUMs)							ESTIMATED FORAGE CAPACITY (AUMs)					
ALLOTMENT ¹	KIND	PERIOD OF USE CURRENT	PROP.	ACTIVE PREF. (AUMs)	AVG. ACT. USE (AUMs)	BIG			WILD HORSES	TOTAL	COMP. FORAGE AVAIL	ADDT ¹ L NON- COMP. BIG GAME FORAGE		INIT. INDI. L/S FORAGE CAP. ³	MGMT. CAT. (MC)
						MULE DEER ²	SHEEP ²	ANTEL ²				TOTAL	TOTAL		
*Summit	Cattle	03/16-05/15	Same	238	58	104YL			104	138	160	298	138	60	
⁵ Tintic Pastures	Cattle	04/01-10/31	Same	840	910	21YL			21	773	0	773	840		M
Twelve-B	Cattle	05/01-05/31	Same	7	7				0	8	0	8	7		M
*Valley Mtn.	Cattle	05/01-06/20	Same	100	100	21YL			21	54	19	83	52		
*Washboard	Cattle	05/16-12/31	Same	860	204	35YL	24W		59	411	103	514	411	500	
West Mona	Cattle	04/11-06/30	TBD	659	533	177YL	109YL		235	713	661	1,374	659	80	
*Yuba	Cattle	03/01-02/28	Same	773	272	21YL	24W		45	542	54	596	542	370	
TOTALS				147,390	98,594	9,964	1,063	1,581	15,558	139,962	15,016	155,068	130,100	17,077	

1. The allotments that are denoted with * are the 38 target allotments that require monitoring and/or proposed allocation adjustments for livestock.
 2. Seasons for Wildlife Species: S-Summer, W-Winter, YL-Year Long.
 3. Initial Indicated Livestock Forage Capacity: The forage levels in this column are the same as those shown in the ACTIVE PREFERENCE column with the exception of the indicated reductions on the 38 allotments. These represent estimates only that will be refined through monitoring studies.
 4. Potential Additional Forage through Vegetation Treatments: These estimates for the over 81,000 suitable treatment acres. Only approx. 65,000 acres are proposed for treatment, so the actual yields will be somewhat less than shown here.
 5. These two allotments have actual use levels that presently exceed active preference. Both allotments have had forage increase due to vegetation treatments and have been licensed on an additional temporary renewable basis.
- TBD - To Be Determined through monitoring studies.

APPENDIX 2
WILDLIFE FORAGE ALLOCATIONS
MILE DEER

ALLOTMENT	CURRENT FORAGE USE	NON- COMP. FORAGE AVAILABLE	TOTAL ALLOCATION	PRIOR STABLE NUMBERS	DIFFERENCE
Antelope	140	35	175	175	0
Big Hollow	35	75	110	120	-10
Bitner Knoll	35	0	35	72	-37
Blue Spring	35	64	99	99	0
Boulter	176	250	426	426	0
Boyd Station	10	0	10	18	-8
Broad Canyon	35	0	35	33	2
Callao Bench	116	0	116	116	0
Cals Valley	21	26	47	54	-7
Cedar Spring	44	12	56	56	0
Chicken Creek	0	7	7	14	-7
Chriss Creek	18	4	22	22	0
Cove	52	50	102	98	4
Cutler	10	6	16	6	10
Death Canyon	100	0	100	471	-371
Deer Foot	52	54	106	55	51
Desert Mountain	147	0	147	93	54
Dust Bowl	167	0	167	167	0
East Fish Spring	35	0	35	85	-50
East Topaz	42	0	42	42	0
Ferner Dog Valley	258	0	258	258	0
Finlinson 21A	26	3	29	29	0
Fool Creek 1	10	0	10	10	0
Fool Creek 2	10	0	10	10	0
Freighter	11	3	14	14	0
Garrett	10	34	44	10	34
Gilson	296	0	296	296	0
Jake's Canyon	35	37	72	55	17
Jenny Lind	35	0	35	35	0
Juab	10	12	22	8	14
Kimball Creek	370	711	1081	1268	-187
Klondike	52	37	89	55	34
Lady Laird	56	0	56	56	0
Levan	38	0	38	38	0
Little Drum	45	0	45	45	0
Lunt-Latimer	0	27	27	98	-71
Maple Peak	2078	2318	4396	3195	1201
McIntyre	200	420	620	200	420
Meadow Creek	56	9	65	65	0
Middle Fork	98	0	98	98	0
Mills	22	76	98	98	0
Mountain	297	246	561	797	-236

APPENDIX 2
WLDLIFE FORAGE ALLOCATIONS
MULE DEER (Continued)

ALLOTMENT	CURRENT FORAGE USE	NON- COMP. FORAGE AVAILABLE	TOTAL ALLOCATION	PRIOR STABLE NUMBERS	D I F F E R E N C E
North Bench	16	0	16	16	0
North Scipio	72	169	241	72	169
Oak City	147	153	300	147	153
Okelberry	237	243	480	952	-472
Paint Mine	26	0	26	26	0
Partoun	290	391	681	1416	-735
Red Butte	35	28	63	63	0
Riley Spring	46	85	131	131	0
Riverbed	80	327	407	431	-24
Rocky Ford	35	82	117	117	0
Round Valley	62	9	71	71	0
Sage Valley 16	52	0	52	52	0
Sage Valley 17	52	153	205	775	-570
Salt Creek	229	178	407	1121	-714
Sand Pass	22	3	25	25	0
Sevier River	70	22	92	92	0
Shearing	140	0	140	140	0
Sheeprock	1148	1099	2247	2132	115
Snadge Hollow	52	61	113	136	-23
Spring Canyon	123	176	299	299	0
Spor Mountain	71	5	76	76	0
Stone	52	54	106	357	-251
Stone Quarry	64	80	144	144	0
Sunmit	104	160	264	104	0
Swasey Knoll	28	0	28	28	0
Table Mountain	56	0	56	134	-78
Tatow	540	0	540	540	0
Tintic Pastures	21	0	21	21	0
Thousand Peaks	796	546	1342	1673	-331
Trail Herd	18	0	18	46	-28
Valley Mountain	21	19	40	54	-14
Washboard	35	0	35	35	0
West Mna	177	52	229	229	0
Wild Horse	47	109	156	281	-125
Yuba	21	54	75	81	-6
Total	10268	8792	19060	20977	-1917

APPENDIX 2
WLDLIFE FORAGE ALLOCATIONS

ANTELOPE

ALLOTMENT	CURRENT FORAGE USE	NON-COMP. FORAGE AVAILABLE	TOTAL ALLOCATION	PRIOR STABLE NUMBERS	DIFFERENCE
Antelope	38	103	141	454	- 313
Beryllium	6	0	6	22	- 16
Bitner Knoll	13	0	13	86	- 73
Boyd Station	26	0	26	13	13
Callao	19	0	19	278	- 259
Callao Bench	19	106	125	278	- 153
Chalk Knolls	38	0	38	203	- 165
Cherry Creek	38	0	38	154	- 116
Cowboy Pass	38	0	38	174	- 136
Coyote Knolls	38	30	58	289	- 221
Crater	38	0	38	260	- 222
Death Canyon	52	0	52	208	- 156
Desert Mountain	52	32	84	177	- 93
Devils Gate	13	0	13	0	13
East Fish Spring	26	0	26	162	- 136
East Topaz	19	72	91	119	- 28
Flint	13	8	21	70	- 49
Freighter	13	31	44	54	- 10
Gandy	38	17	55	227	- 172
Gilson	6	16	22	22	0
Henry Creek	6	0	6	0	6
Kane Spring	6	0	6	33	- 27
Knoll Spring	6	0	6	6	0
Lady Laird	38	0	38	214	- 176
Little Drum	38	0	38	309	- 271
Lynndyl	6	23	29	27	2
Maple Peak	0	0	0	66	- 66
Marble Wash	26	0	26	26	0
McIntyre	6	76	82	82	0
Meadow Creek	45	43	88	198	- 110
Nelson	13	0	13	34	- 21
Partoun	64	0	64	64	0
Riverbed	77	0	77	208	- 131
Sand Pass	6	76	82	133	- 51
Shearing	0	49	49	49	0
Sheep	13	0	13	88	- 75
Sheeprocks	0	0	0	22	- 22
Smelter Mountain	19	0	19	272	- 253
Smith Creek	0	0	0	70	- 70
Spor Mountain	26	73	99	204	- 105
Sugarville	13	0	13	102	- 89
Swazy Knoll	51	0	51	200	- 149

APPENDIX 2
WLDLIFE FORAGE ALLOCATIONS
ANTELOPE (Continued)

ALLOTMENT	CURRENT FORAGE USE	NON- COMP. FORAGE AVAILABLE	TOTAL ALLOCATION	PRIOR STABLE NUMBERS	DIFFERENCE
Table Mountain	51	0	51	165	- 114
Tatow	32	166	198	208	- 10
Thousand Peaks	409	0	409	409	0
Topaz	0	0	0	3	- 3
Tule Spring	13	0	13	62	- 49
Warm Creek	19	0	19	19	0
Wild Horse	51	0	51	142	- 91
Total	1577	921	2498	6665	- 4167

APPENDIX 2
WILDLIFE FORAGE ALLOCATIONS

ELK

ALLOTMENT	CURRENT FORAGE USE	NON-COMP. FORAGE AVAILABLE	TOTAL ALLOCATION	PRIOR STABLE NUMBERS	DIFFERENCE
Blue Spring	41	18	59	41	18
Boulter	30	34	64	30	34
Broad Canyon	34	68	102	34	68
Cedar Spring	0	4	4	2	2
Chicken Creek	18	0	18	18	0
Chriss Creek	24	19	43	0	43
Dust Bowl	58	300	358	11	347
Ferner Dog Valley	117	817	934	117	817
Finlinson 21A	29	62	91	29	62
Gilson	137	581	718	137	581
Jenny Lind	6	61	67	6	61
Kimball Creek	167	0	167	0	167
Levan	41	127	168	41	127
Lunt-Latimer	23	0	23	23	0
Middle Fork	47	137	184	47	137
Mills	47	8	55	47	8
Nephi Bench	12	47	59	12	47
Okelberry	110	0	110	110	0
Paint Mne	0	89	89	29	60
Red Butte	53	50	103	53	50
Riley Spring	0	6	6	29	-23
Rocky Ford	0	59	59	63	-4
Round Valley	25	90	115	25	90
Sage Valley 16	35	145	180	35	145
Sage Valley 17	80	0	80	80	0
SaIt Creek	69	0	69	80	-11
Sevier River	0	248	248	18	230
Shearing	0	925	925	46	879
Spring Canyon	80	34	114	80	34
Stone Quarry	41	98	139	41	98
Washboard	24	103	127	24	103
West Mbn	109	609	718	109	609
Yuba	24	0	24	24	0
Total	1481	4739	6220	1441	4779

APPENDIX 2
WLDLIFE FORAGE ALLOCATIONS
BIGHORN SHEEP

ALLOTMENT	CURRENT FORAGE USE	NON- COMP. FORAGE AVAILABLE	TOTAL ALLOCATION	PRIOR STABLE NUMBERS	DIFFERENCE
Callao Bench	2	31	33	33	0
East Fish Spring	2	0	2	113	-111
Mountain	1	147	148	148	0
Partoun	1	64	65	65	0
Thousand Peaks	44	292	336	336	0
Trail Herd	0	0	0	31	-31
Total	50	534	584	726	-142

APPENDIX 3
ALLOTMENT WATERSHED
ANALYSIS

Priority	Allotment	Erosion Mod (%)	Condition Critical (Acres)	Class Non-Point Source	Critical Aquifer Recharge Areas	Potential for Over-Grazing	Ranking 2
4	Antelope				X	X	2
	Beryllium	34	335	X			4
	Boyd Station				X	X	2
	Big Hollow			X			1
	Bitner Knoll				X	X	2
	Blue Spring			X	X		2
	Boulter				X		1
	Broad Canyon	46		X			2
	Callao Bench				X		1
	Cal's Valley			X			1
	Chalk Knoll	42					1
	Cherry Creek	30					1
	Chicken Creek			X			1
	Chriss Creek			X			1
	Cove			X	X		2
	Cutler			X			1
	Cowboy Pass				X	X	2
	Coyote Knolls				X	X	2
	Crater				X		1
	Death Canyon				X	X	2
	Deer's Foot			X			1
	Desert Mountain				X		1
	Devil's Gate				X	X	2
	Oust Bowl			X	X		2
	East Fish Spring				X		1
	East Topaz				X		1
	Ferner Dog Valley	67					1
16	Finlinson	100		X	X		3
	Flint				X		1
2	Fool Creek #1			X		1	
15	Fool Creek #2		120	X			3
	Freighter				X		1
	Gandy				X		1
	Garrett	64					1
11	Gilson	50		X	X		3
	Henry Creek				X		1
14	Jake's Canyon			X	X	X	3
	Jenny Lind				X		1
	Juab			X	X		2
	Kane Spring				X		1
	Kimball Creek				X	X	2
	Klondike			X			1
	Knoll Spring	42			X		2
	Lady Laird				X	X	2
	Levan			X			1
	Little Drum				X	X	2
	Lunt-Latimer			X			1
	Lynndyl	155		X			2

**APPENDIX 3
ALLOTMENT WATERSHED
ANALYSIS**

Priority	Allotment	Erosion Condition Class Mod (%)	Critical (Acres)	Non-Point Source Poll	Critical Aquifer Recharge Areas	Potential for Over- Grazing	Ranking 2
1	Maple Peak		1,554		X	X	3
	Marble Wash				X		1
5	McIntyre		24,515	X	X		3
	Meadow Creek				X		1
	Middle Fork			X			1
	Mills			X			1
	Nelson		3,264				2
7	Nephi Bench	34		X	X		3
13	North Scipio			X	X	X	3
3	Oak City	3	7,134	X			4
	Okelberry				X	X	2
19	Paint Mine	54		X	X	X	4
	Partoun				X		1
	Red Butte			X	X		2
	Riley Spring	80					1
	Riverbed				X		1
9	Rocky Ford	70		X	X		3
	Sage Valley 16			X			1
	Sage Valley 17			X			1
	Salt Creek			X			1
18	Sand Pass			X	X	X	3
8	Sevier River			X	X	X	3
10	Shearing	56	326				3
	Sheep	33					1
	Sheep Rocks	57					1
	Smelter Mountain	60					1
	Smith Creek				X		1
	Snadge Hollow			X			1
	Spor Mountain				X		1
	Spring Canyon			X			1
	Stone			X			1
	Stone Quarry			X			1
17	Sugarville	40	3,597				3
	Swasey Knoll				X	X	2
	Table Mountain				X	X	2
	Tatow				X		1
	Tintic Pasture				X		1
	Thousand Peaks				X		1
	Trail Herd				X		1
	Tule Spring				X	X	2
	Tule Valley	31					1
12	Valley Mountain			X	X	X	3
	Warm Creek				X		1
	Wash Board			X			1
6	West Mtn	35		X	X		3
	Wild Horse				X	X	2
	Yuba			X			1

1. Entries in the Acres Critical Condition column are given a double ranking as it appears to be twice as important to decision making as other items.
2. This ranking provides a range within which priorities were established.

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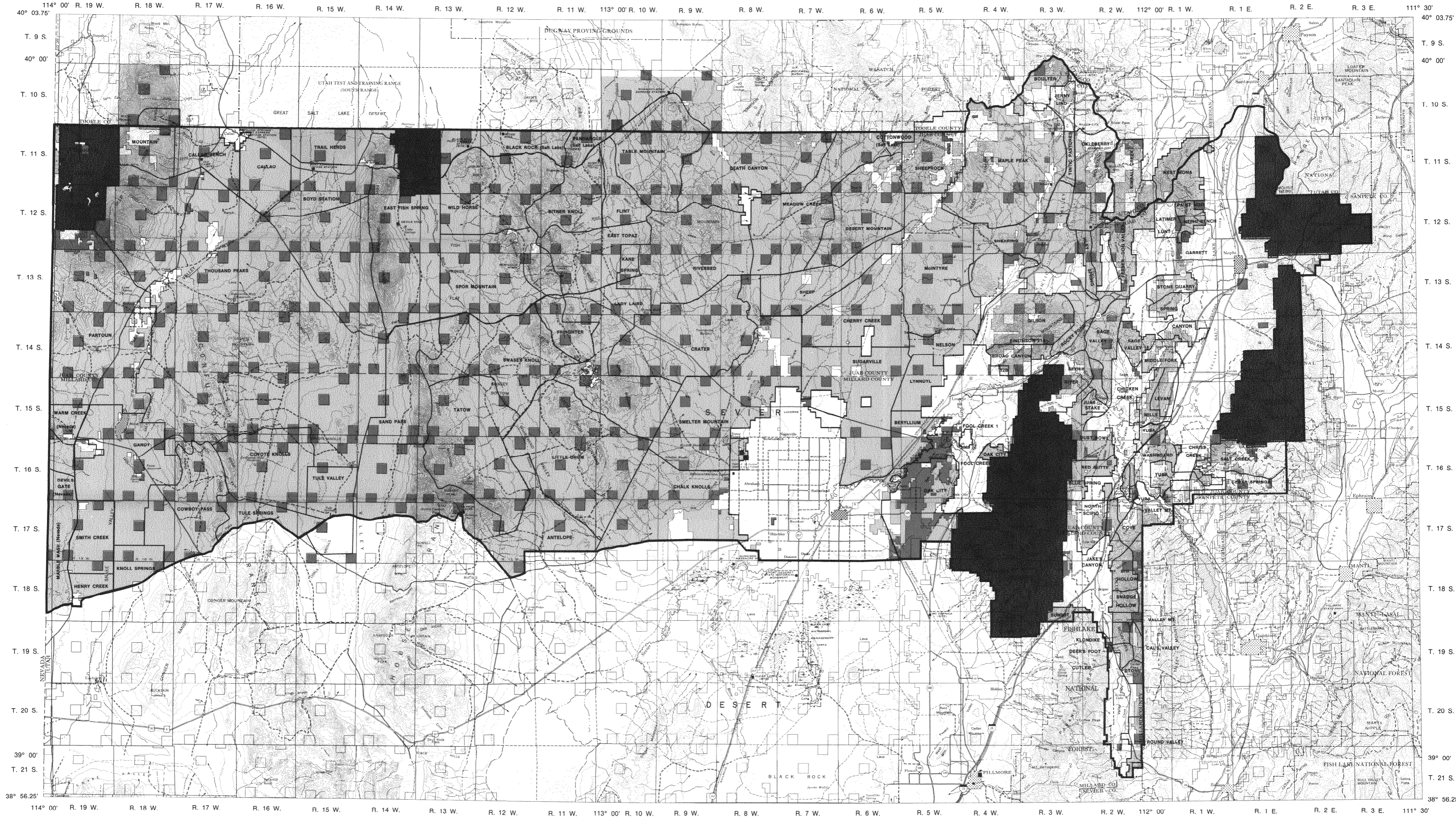
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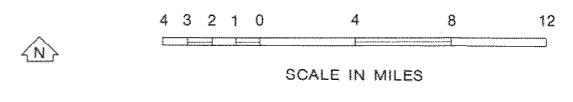
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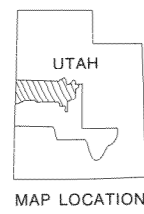
HOUSE RANGE RESOURCE AREA

ALLOTMENT BOUNDARIES AND LAND OWNERSHIP

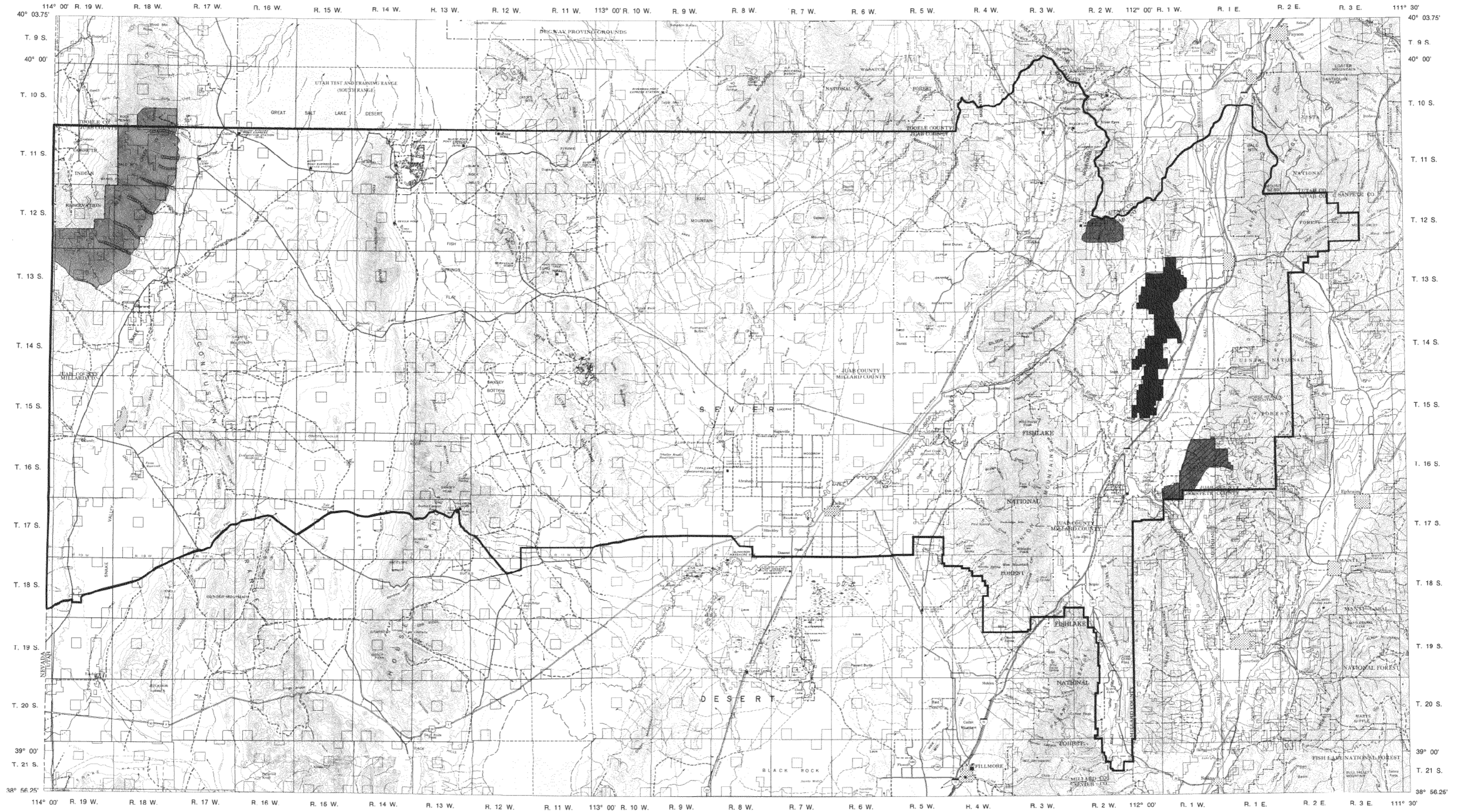
- PUBLIC LAND (BLM)
- FEDERAL LAND, OTHER AGENCIES
- STATE LAND
- PRIVATE LAND
- LIVESTOCK GRAZING ALLOTMENT BOUNDARIES



MAP 1








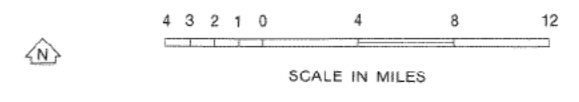
MAP LOCATION



HOUSE RANGE RESOURCE AREA

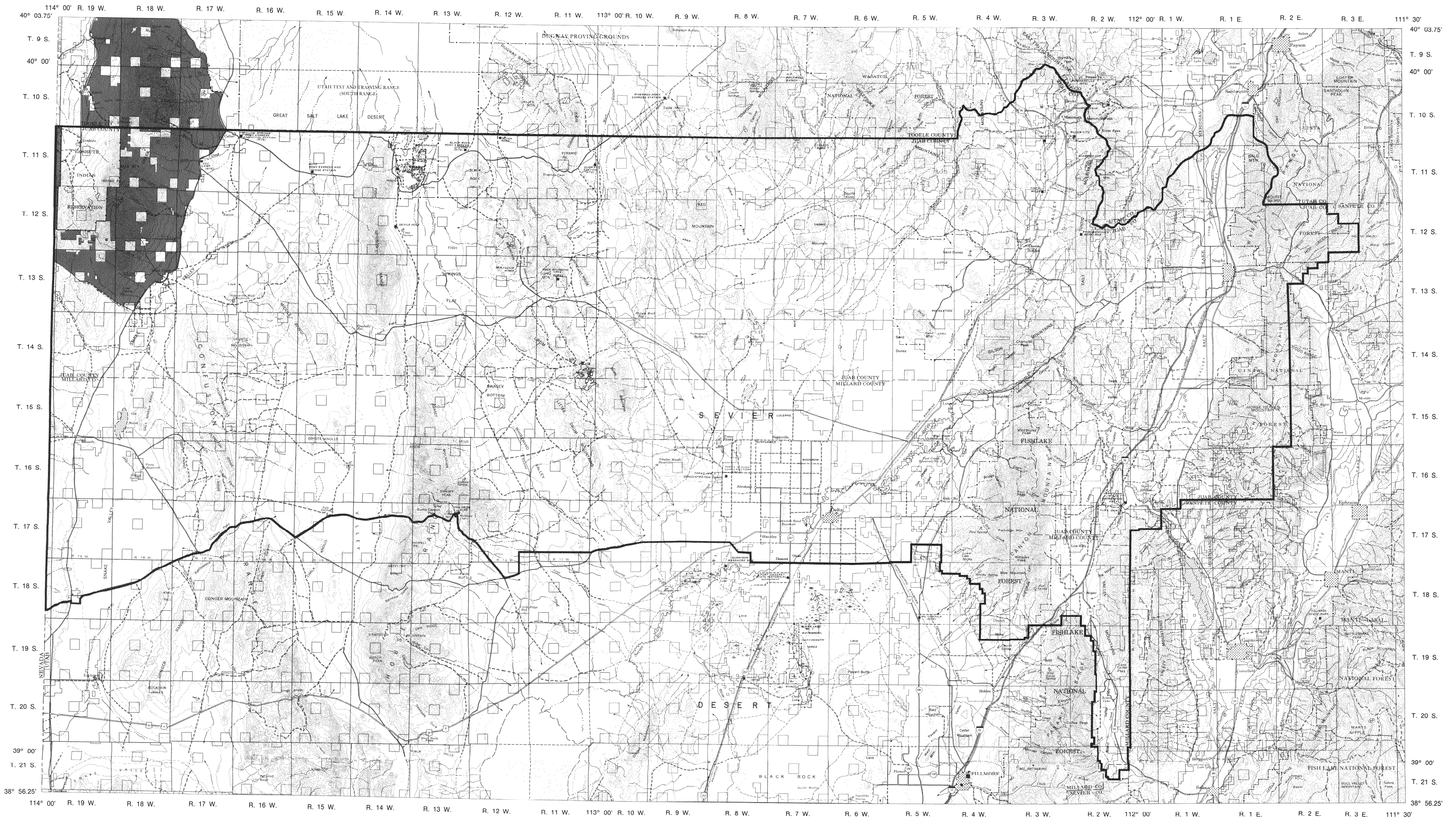
MULE DEER, ELK AND ROCKY MOUNTAIN BIGHORN SHEEP HABITAT

-  ROCKY MOUNTAIN BIGHORN SHEEP AREA
-  CRITICAL ELK SUMMER RANGE
-  CRITICAL ELK WINTER RANGE
-  CRITICAL MULE DEER WINTER RANGE
-  CRITICAL MULE DEER FAWNING AREAS



MAP 2





HOUSE RANGE RESOURCE AREA

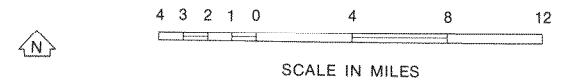
DEEP CREEK HABITAT MANAGEMENT PLAN

 DEEP CREEK HMP

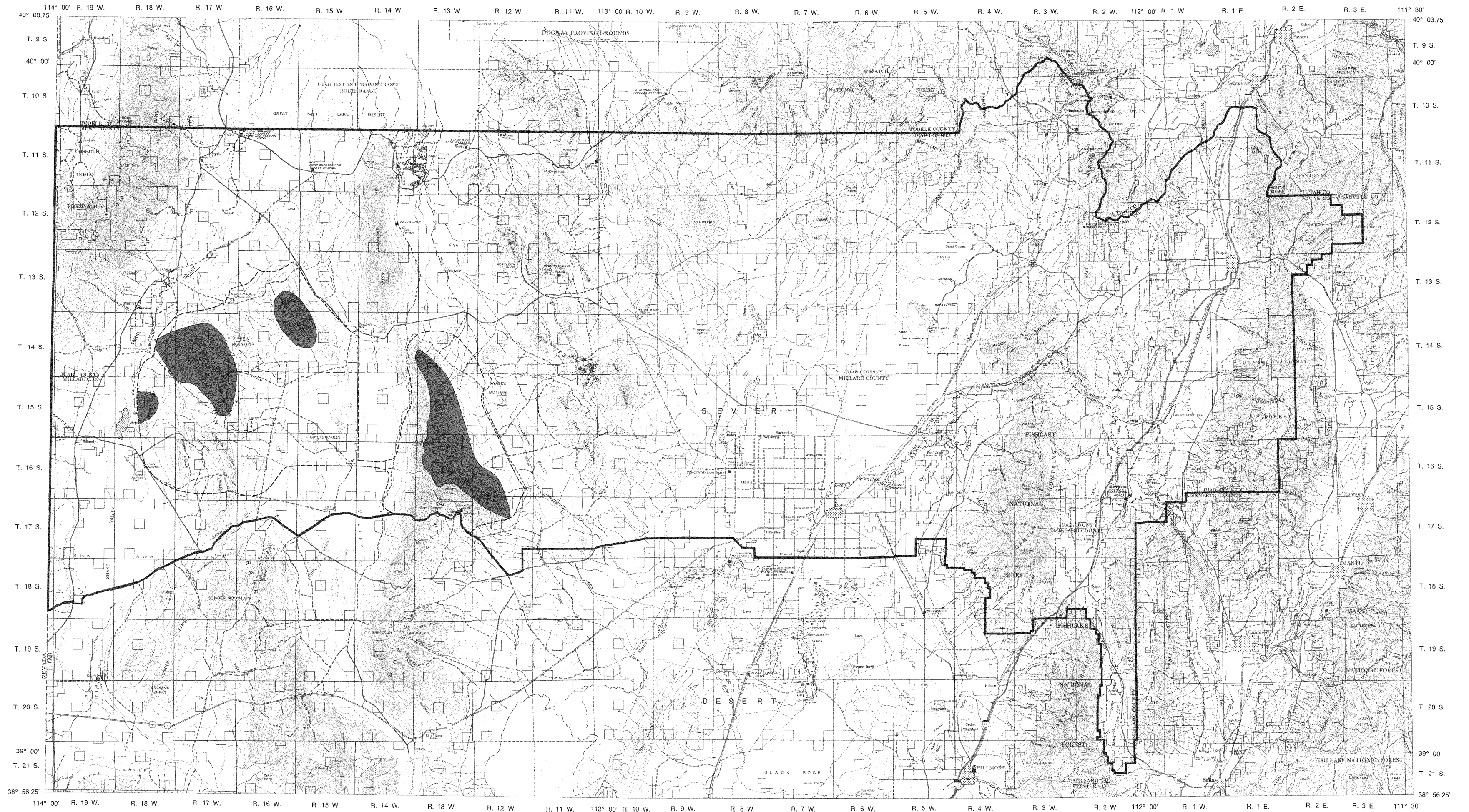


MAP 3

MAP LOCATION



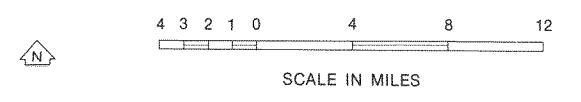
SCALE IN MILES



HOUSE RANGE RESOURCE AREA

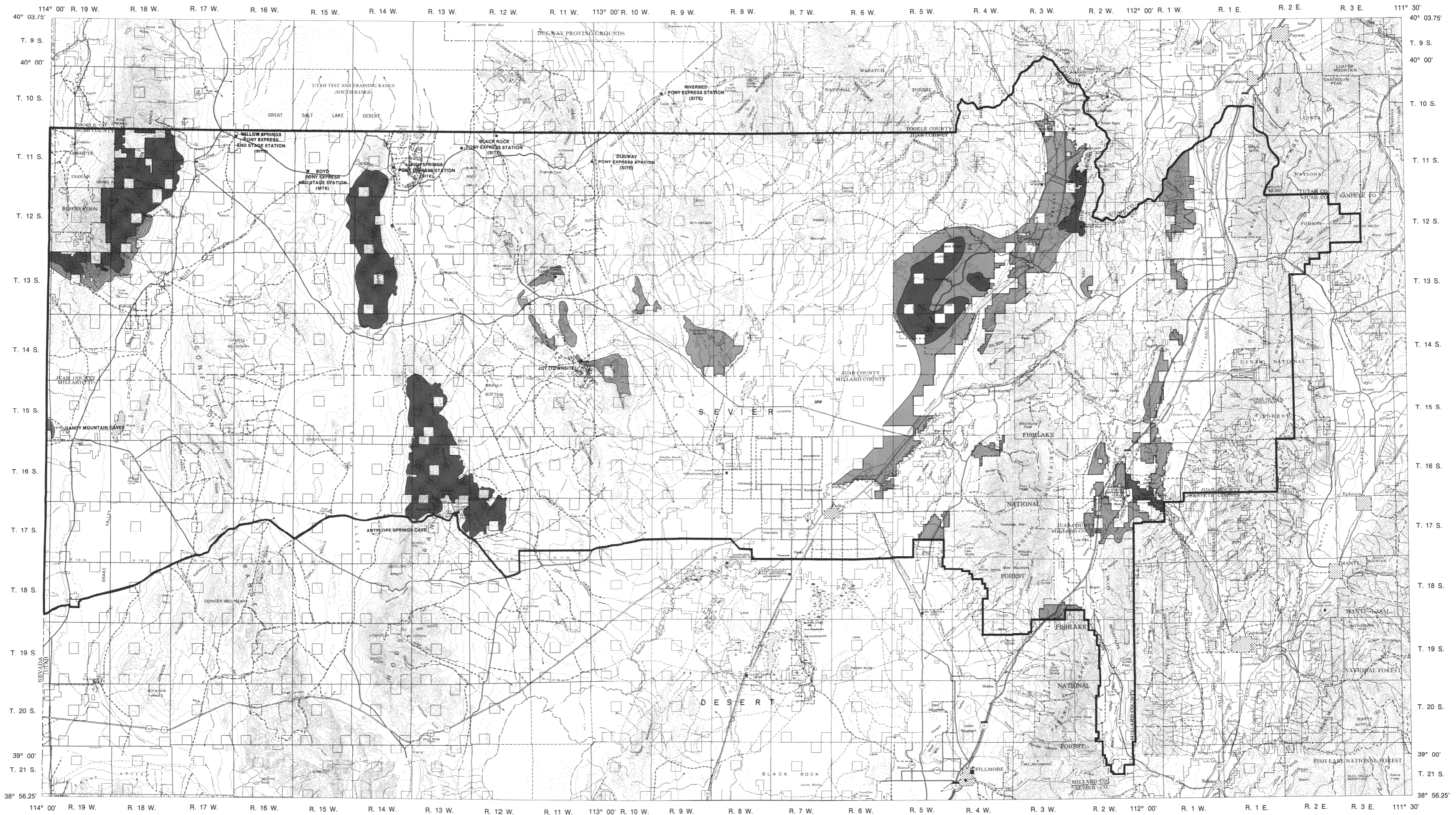
WILD HORSE HERD BOUNDARIES AND CRITICAL AREAS

- WILD HORSE HERD BOUNDARIES
- CRITICAL WILD HORSE AREAS



MAP 4

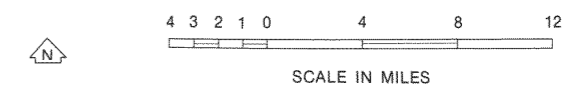




HOUSE RANGE RESOURCE AREA

VISUAL RESOURCE MANAGEMENT CLASSES

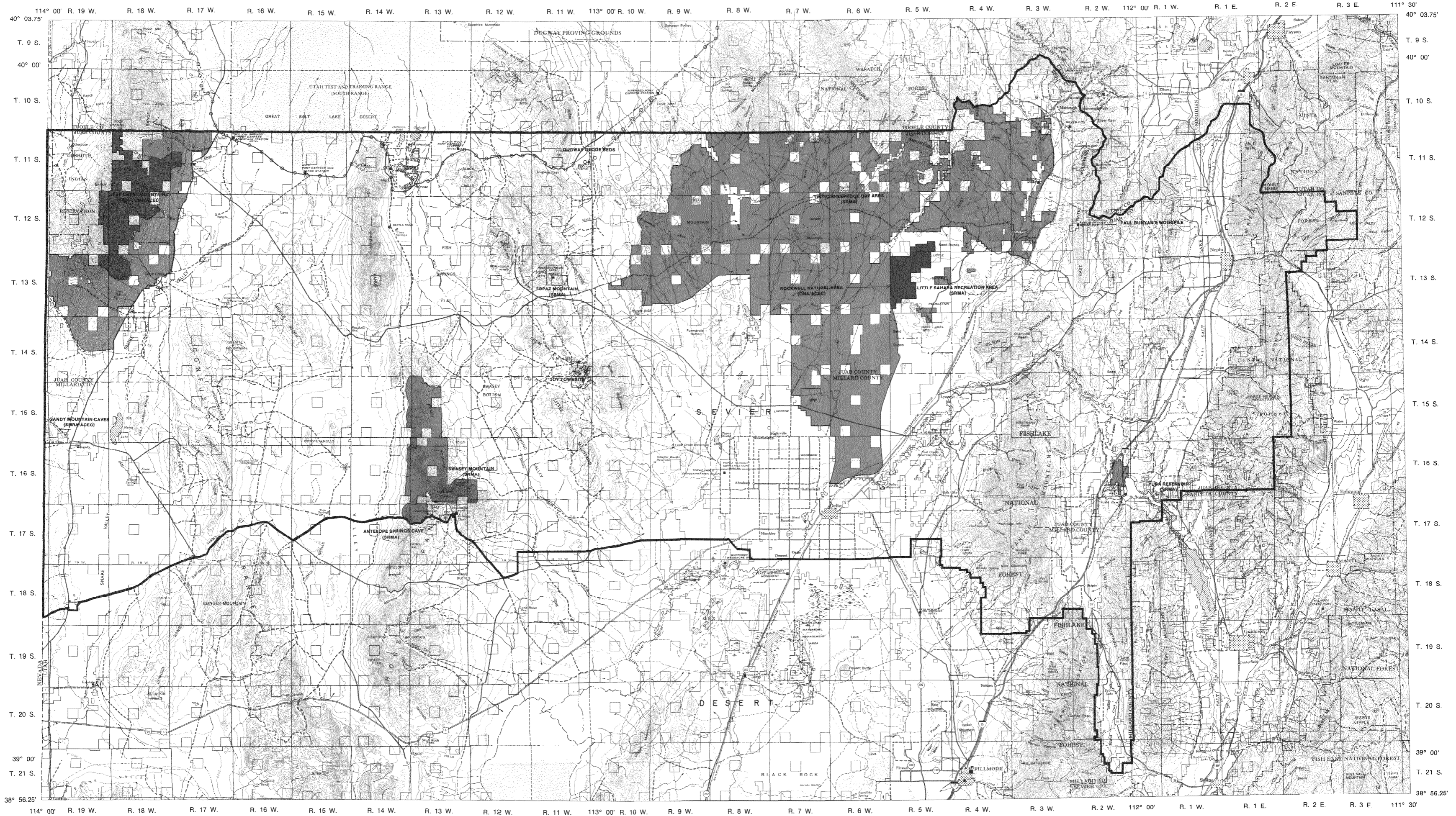
- VRM — CLASS II
- VRM — CLASS III
- VRM — CLASS IV



MAP 5



MAP LOCATION

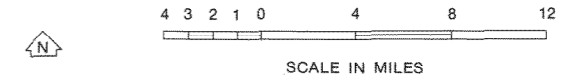


HOUSE RANGE RESOURCE AREA

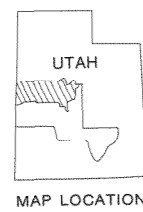
SPECIAL MANAGEMENT AREAS AND OFF ROAD VEHICLE (ORV) DESIGNATIONS

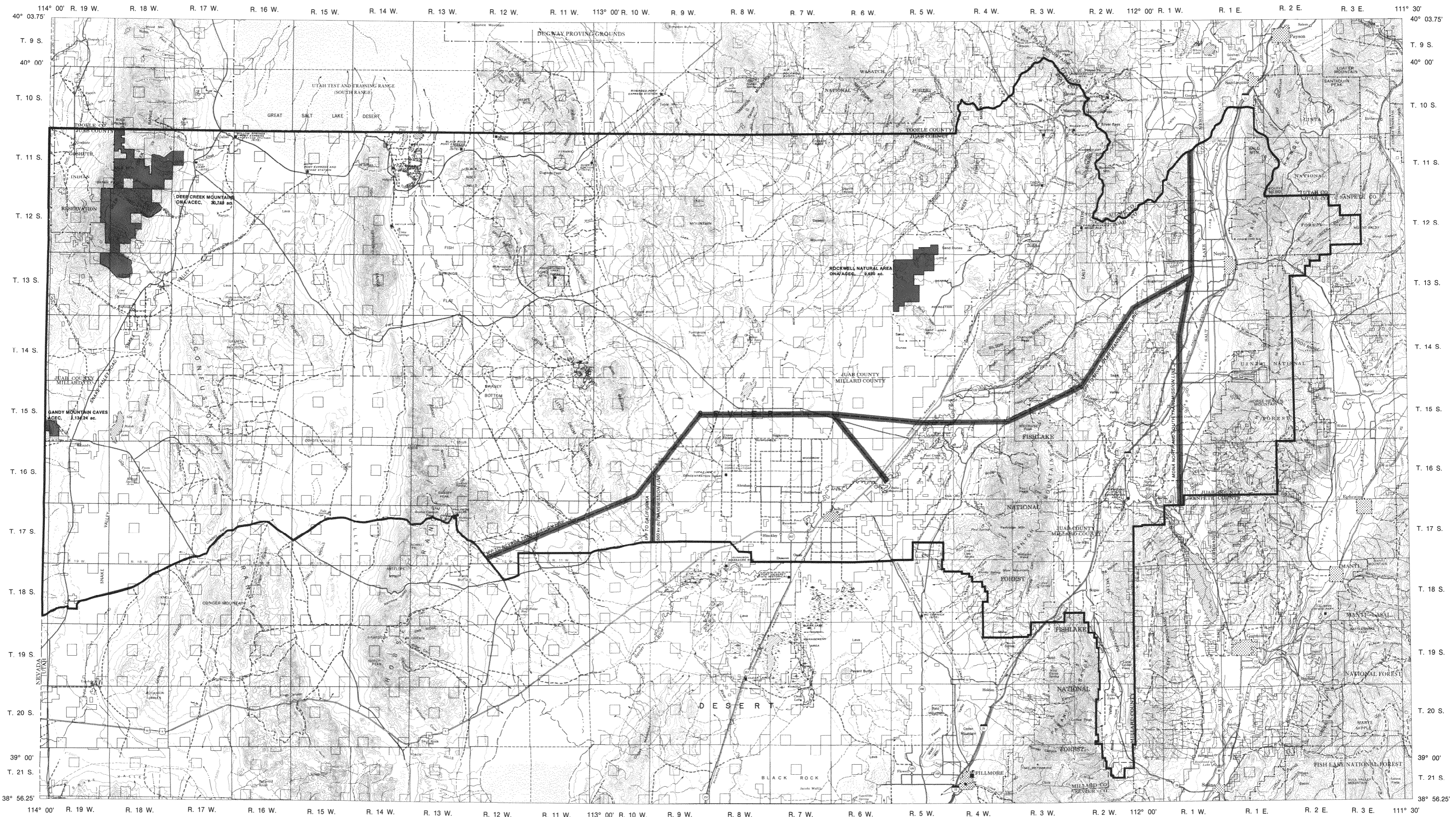
SPECIAL MANAGEMENT AREAS
 ONA/ACEC Outstanding Natural Area/Area of Critical Environmental Concern
 ACEC Area of Critical Environmental Concern
 SRMA Special Recreation Management Area

OFF ROAD VEHICLE (ORV) DESIGNATIONS
 ■ **CLOSED** TO ORVS
 ■ **LIMITED** TO EXISTING AND/OR DESIGNATED ROADS AND TRAILS
 □ **OPEN** TO ORV USE
 ○ ○ ○ PONY EXPRESS ROUTE



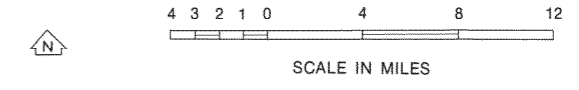
MAP 6



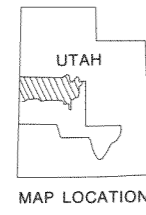


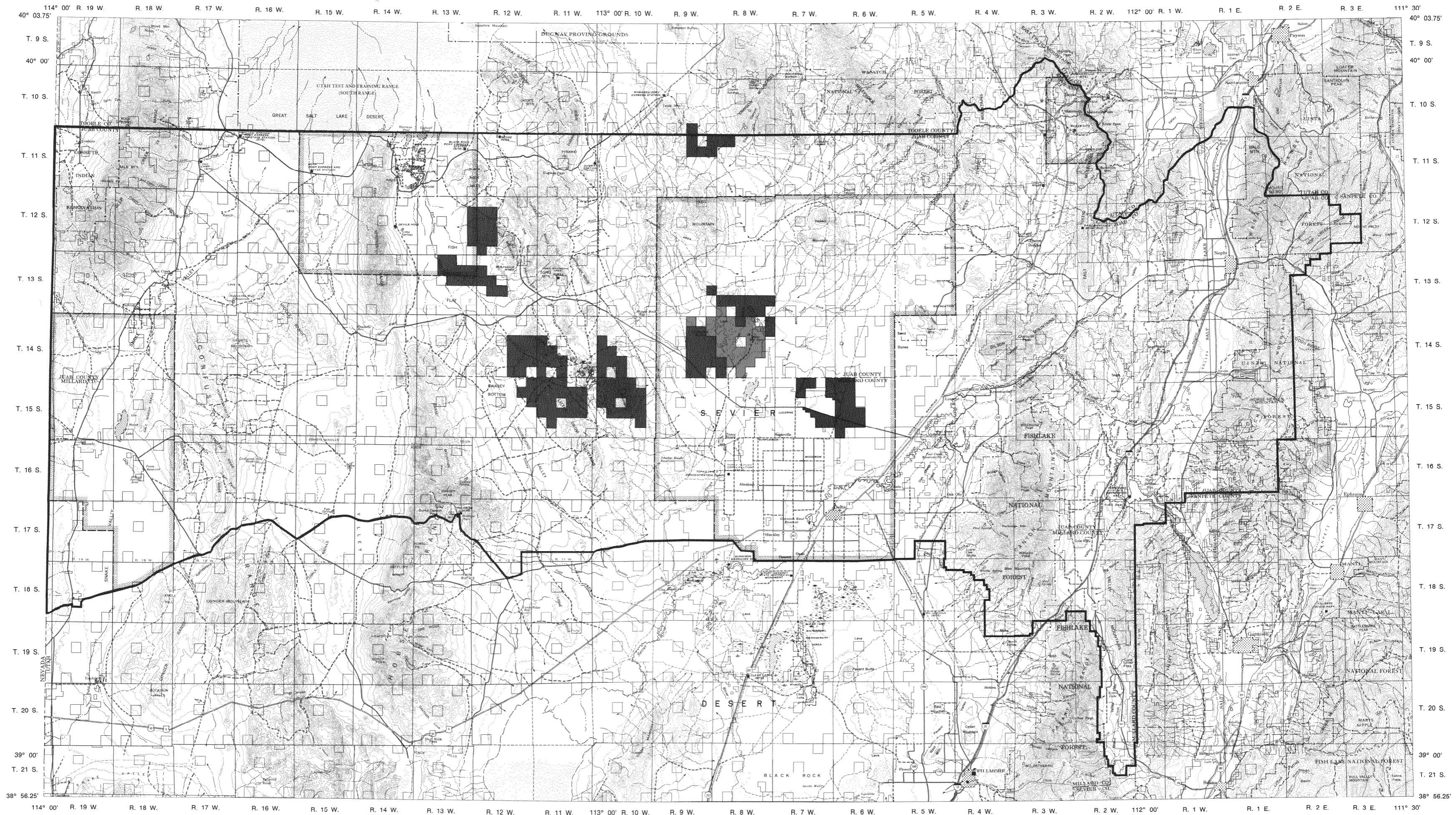
HOUSE RANGE RESOURCE AREA

- AREAS OF CRITICAL ENVIRONMENTAL CONCERN (ACECs)
AND
RIGHTS — OF — WAY CORRIDORS
- AREAS OF CRITICAL ENVIRONMENTAL CONCERN (ACECs)
 - RIGHTS — OF — WAY CORRIDORS






MAP 7

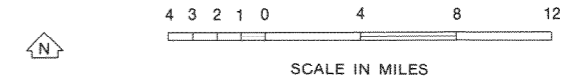




HOUSE RANGE RESOURCE AREA

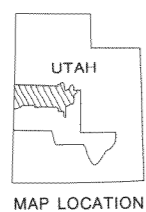
GEOHERMAL RESOURCES

-  LANDS CLASSIFIED IN A KNOWN GEOHERMAL RESOURCE AREA (KGRA)
-  GEOHERMAL LEASES
-  LANDS CLASSIFIED PROSPECTIVELY VALUABLE FOR GEOHERMAL RESOURCES

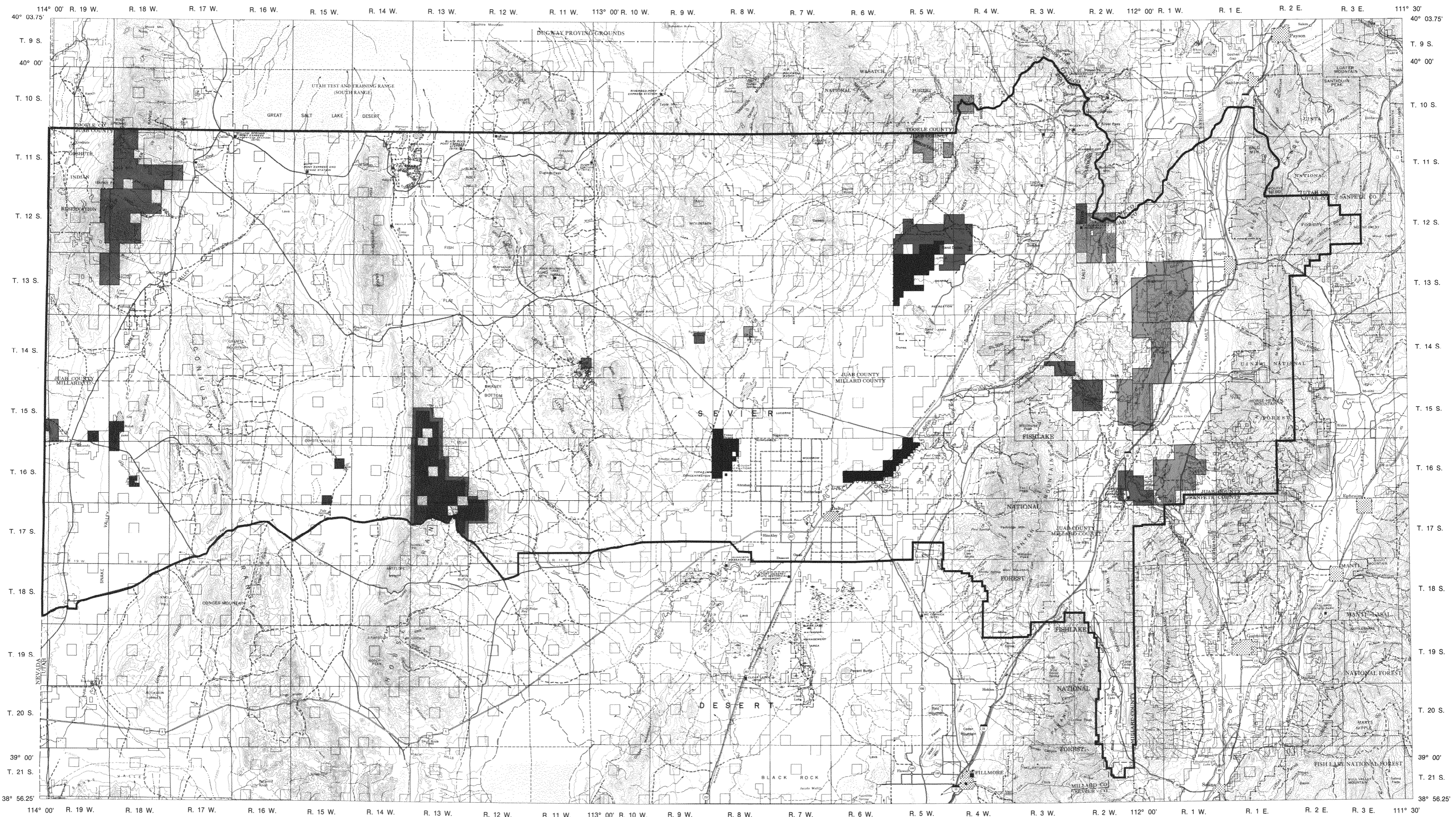


SCALE IN MILES

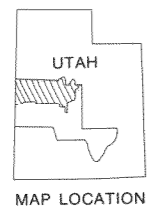
MAP 8



MAP LOCATION



HOUSE RANGE RESOURCE AREA



MAP 9

MAP LOCATION

LOCATABLE MINERALS

THE FOLLOWING AREAS WILL BE WITHDRAWN FROM ALL MINERAL ENTRY EXCEPT PERSONAL RECREATIONAL USE OF MINERAL MATERIALS.

NAME OF AREA	ACREAGE
Rockwell Natural Area	9,630
Topaz Wildlife Conservation Area* (oil & gas)	4,142
Topaz Mountain	1,600
Dugway Geode Beds	1,920
Gandy Mountain Caves	1,120
Little Sahara Campground*	3,542
*Existing Withdrawal	

OIL AND GAS CATEGORIES AND LOCATABLE MINERALS

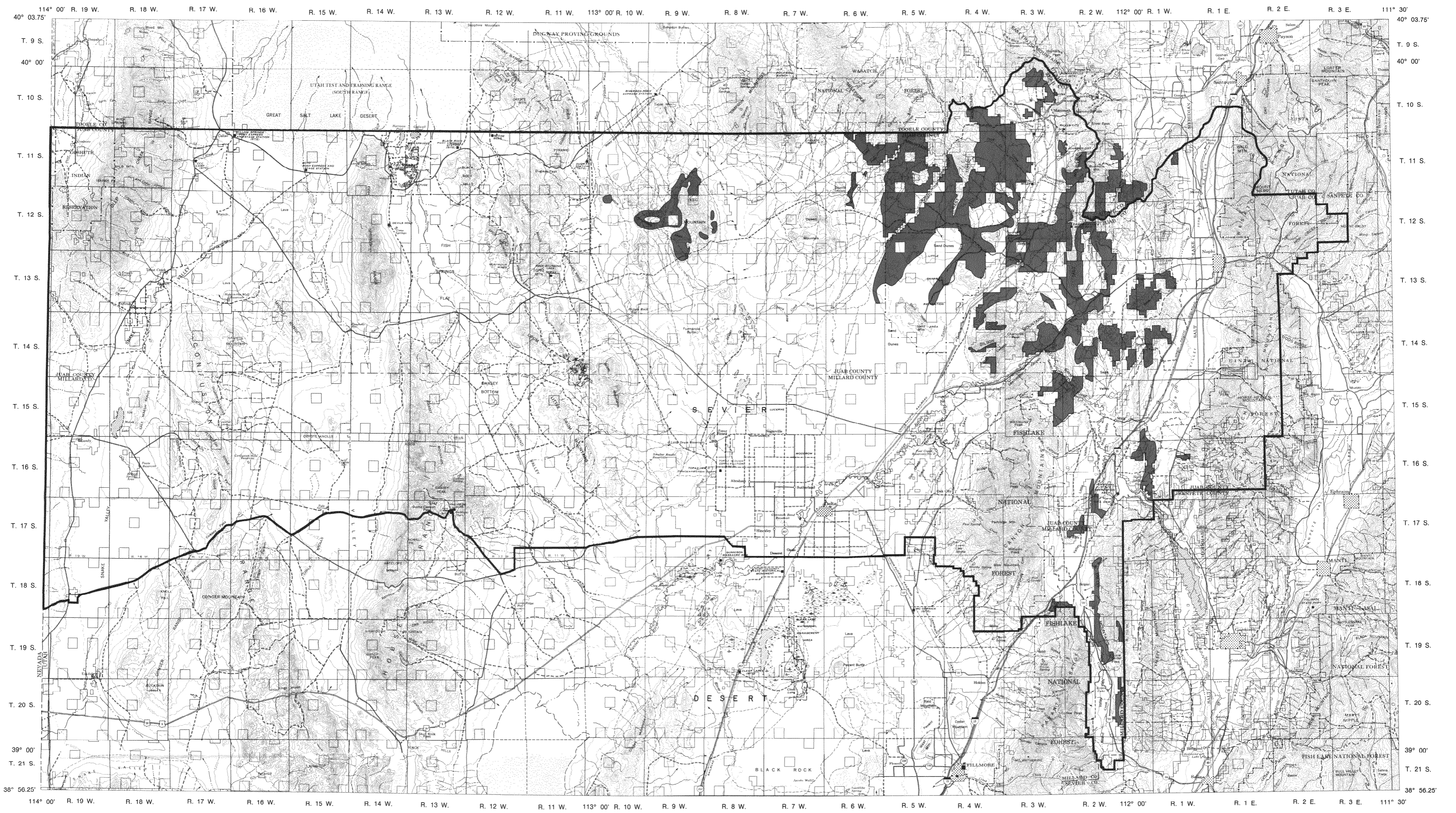
OIL AND GAS CATEGORIES

- CATEGORY 1
- CATEGORY 2
- CATEGORY 3
- CATEGORY 4



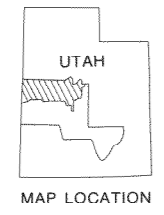
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SCALE IN MILES



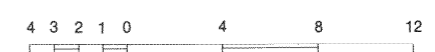
HOUSE RANGE RESOURCE AREA

AREAS SUITABLE FOR REVEGETATION



MAP 10

MAP LOCATION



SCALE IN MILES

From: Michael Saul
To: Casper_WYMail@blm.gov
Cc: "[Shelley Silbert](mailto:Shelley_Silbert)"; katie.schaefer@sierraclub.org; Michael Saul; Diana Dascalu-Joffe
Date: Wednesday, August 24, 2016 6:25:25 PM
Attachments: [CBD et al Comments Wyoming Feb 2017 HPD Lease Sale 8-24-16.pdf](#)

Mr. Sorenson,

Please find attached the comments of the Center for Biological Diversity, Great Old Broads for Wilderness, and the Sierra Club on the High Plains District's EA for its proposed February 2017 oil and gas lease sale.

Sincerely,

Michael Saul

Senior Attorney, Public Lands

Center for Biological Diversity

Denver, CO

phone/text 303-915-8308

msaul@biologicaldiversity.org

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Rita Allen
Bureau of Land Management
Wind River/Bighorn Basin District Office
101 South 23rd Street
Worland, WY 82401
Via email to: blm_wy_wrbdd_lease@blm.gov

August 24, 2016

RE: February 2017 Lease Parcels
Comments of the Center for Biological Diversity et al. on the Environmental Assessment for the High Plains District

Ms. Allen:

I am submitting these comments on behalf of the Center for Biological Diversity, Great Old Broads for Wilderness, and the Sierra Club, on the Environmental Assessment (“EA”) for the February 2017 Competitive Lease Sale for the Wind River/Bighorn Basin District.

The Center for Biological Diversity is a non-profit environmental organization dedicated to the protection of native species and their habitats through science, policy, and environmental law. The Center also works to reduce greenhouse gas emissions to protect biological diversity, our environment, and public health. The Center has over 1.1 million members and on-line activists, including those living in Wyoming who have visited these public lands in the High Plains District for recreational, scientific, educational, and other pursuits and intend to continue to do so in the future, and are particularly interested in protecting the many native, imperiled, and sensitive species and their habitats that may be affected by the proposed oil and gas leasing.

Great Old Broads for Wilderness (Broads) is a national non-profit organization with over 8,000 members and advocates, working to engage and ignite the activism of elders to preserve and protect wilderness and wild lands. Conceived by older women who love wilderness, Broads gives voice to the millions of older Americans who want to protect their public lands as Wilderness for this and future generations. Broads believes that public lands should be part of the solution to climate change, not part of the problem.

The Sierra Club is a national nonprofit organization of approximately 625,000 members dedicated to exploring, enjoying, and protecting the wild places of the earth; to practicing and promoting the responsible use of the earth’s ecosystems and resources; to educating and enlisting humanity to protect and restore the quality of the natural and human environment; and to using all lawful means to carry out these objectives. Sierra Club members use the public lands in Wyoming, including the lands and waters that would be affected by the increased oil and gas development proposed under the lease sale, for quiet recreation, aesthetic pursuits, and spiritual renewal.



For the reasons set forth below, this EA does not satisfy the requirements of NEPA, and the proposed lease sale would therefore violate the National Environmental Policy Act (“NEPA”), the Mineral Leasing Act (“MLA”), the Federal Lands Policy and Management Act (“FLPMA”), and the Endangered Species Act. BLM should produce a full Environmental Impact Statement (“EIS”) for the lease sale. In particular, BLM’s EA for the proposed lease sale, fails to comply with NEPA’s obligation to consider indirect and cumulative impacts, including impacts from climate change, fails to meet its obligations to consider foreseeable environmental impacts to greater sage-grouse, including consideration of relevant and readily available scientific information.

I. The EA Improperly Limits its Analysis of Reasonably Foreseeable Environmental Impacts

NEPA demands that a federal agency prepare an EIS before taking a “major [f]ederal action[] significantly affecting the quality’ of the environment.” *Kern v. U.S. Bureau of Land Mgmt.*, 284 F.3d 1062, 1067 (9th Cir. 2002). In order to determine whether a project’s impacts may be “significant,” an agency may first prepare an EA. 40 C.F.R. §§ 1501.4, 1508.9. If the EA reveals that “the agency’s action may have a significant effect upon the . . . environment, an EIS must be prepared.” *Nat’l Parks & Conservation Ass’n v. Babbitt*, 241 F.3d 722, 730 (9th Cir. 2001) (internal quotations omitted). If the agency determines that no significant impacts are possible, it must still adequately explain its decision by supplying a “convincing statement of reasons” why the action’s effects are insignificant. *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1212 (9th Cir. 1998). Further, an agency must prepare all environmental analyses required by NEPA at “the earliest possible time.” 40 C.F.R. § 1501.2. “NEPA is not designed to postpone analysis of an environmental consequence to the last possible moment,” but is “designed to require such analysis as soon as it can reasonably be done.” *Kern*, 284 F.3d at 1072.

BLM has unlawfully restricted its NEPA analysis by arbitrarily limiting the scope of its analysis of oil and gas activity that may result from the lease sale and by failing to analyze sufficiently site-specific impacts. NEPA regulations and caselaw require that BLM evaluate all “reasonably foreseeable” direct and indirect effects of its leasing. 40 C.F.R. § 1508.8; *Davis v. Coleman*, 521 F.2d 661, 676 (9th Cir. 1975); *Center for Biological Diversity v. Bureau of Land Mgmt.*, 937 F.Supp.2d 1140 (N.D. Cal. March 31, 2013) (holding that oil and gas leases were issued in violation of NEPA where BLM failed to prepare an EIS and unreasonably concluded that the leases would have no significant environmental impact because the agency failed to take into account all reasonably foreseeable development under the leases).

BLM, in its Wind River/Bighorn Basin February 2017 Lease Sale EA, arbitrarily refuses to consider sufficiently site-specific impacts. BLM indicates it does not have to consider some, or perhaps all, site-specific impacts because the exact extent of those impacts is unknown at this stage and subject to regulation at a later date.¹ BLM asserts that, “The level of development that might occur as an outcome leasing is unknown. A more precise description of environmental effects would be possible if the exact level of development were known. The BLM determined that any estimation of development at this time

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is too speculative to be analyzed as part of this EA.”² BLM’s interpretation of the Tenth Circuit’s NEPA law is plainly erroneous, as the Tenth Circuit has repeatedly clarified in later cases. *See Pennaco Energy, Inc. v. U.S. Dep’t of Interior*, 377 F.3d 1147, 1160 (10th Cir. 2004) (requiring analysis of coalbed methane development impacts at the oil and gas leasing stage). The Tenth Circuit in *New Mexico ex rel. Richardson v. BLM*, 565 F.3d 683 (10th Cir. 2009), explained in detail the extent of BLM’s obligations at the leasing stage:

Taken together, [*Park County* and *Pennaco Energy*] establish that there is no bright line rule that site-specific analysis may wait until the APD stage. Instead, the inquiry is necessarily contextual. Looking to the standards set out by regulation and by statute, assessment of all “reasonably foreseeable” impacts must occur at the earliest practicable point, and must take place before an “irretrievable commitment of resources” is made. 42 U.S.C. § 4332(2)(C)(v); *Pennaco Energy*, 377 F.3d at 1160; *Kern*, 284 F.3d at 1072; 40 C.F.R. §§ 1501.2, 1502.22. Each of these inquiries is tied to the existing environmental circumstances, not to the formalities of agency procedures. Thus, applying them necessarily requires a fact-specific inquiry.

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The proposed lease sale would result in impacts that BLM will not be able to avoid once the lease sale is finalized because the agency’s ability to prevent lessees from engaging in lawful activities on issued leases will be limited. BLM regulations provide that lessees “have the right to use so much of the leased lands as is necessary to explore for, drill for, mine, extract, remove and dispose of all the leased resource in a leasehold subject to” limited conditions, including lease stipulations, “specific, nondiscretionary statutes,” and limited “reasonable measures” that do not preclude all development activities. 43 C.F.R. § 3101.1-2. Under *Pennaco Energy* and *New Mexico v. BLM*, BLM cannot simply assert that site-specific analysis may wait until the APD stage, but must consider whether non-“no surface occupancy” leases constitute an irretrievable commitment of resources, and whether development impacts are reasonably foreseeable, in the context of known fuel supply, industry plans, and existing and ongoing development.

NEPA requires that an agency conduct all environmental analyses at “the earliest possible time.” 40 C.F.R. § 1501.2; *see also New Mexico*, 565 F.3d at 718. Here, this means that BLM must analyze all site-specific impacts now, before it has leased the land and is unable to prevent environmental impacts.

II. The EA Fails to Disclose Impacts to Climate Change from Oil and Gas Leasing

The Center, Great Old Broads, the Sierra Club, and others, have repeatedly requested that the BLM address the greenhouse gas emission consequences, including both the direct emissions (combustion and leakage) from the extraction process and the reasonable foreseeable emissions of transport, processing, and combustion of oil and gas. The EA, however, continues to rely decline to engage in meaningful cumulative quantification or assessment of greenhouse gas consequences from its

² *Id.*



oil and gas leasing operations, based on rationales that have been conclusively rejected in final guidance from the Council on Environmental Quality, NEPA's implementing body.

A. BLM Has Failed to Analyze Adequately the Project's Climate Change Impacts

NEPA's environmental analysis requirement includes consideration of climate change. *See Center v. NHTSA*, 538 F.3d at 12-1216-17. Oil and gas operations are a major contributing factor to climate change, due both to emissions from the operations themselves and emissions from the combustion of the oil and gas produced. BLM's continued refusal to address the life-cycle greenhouse gas (GHG) emissions of fossil fuel production, transport, processing, and combustion from public lands is contrary to NEPA, and squarely contrary to the Council on Environmental Quality's recently finalized Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews.³

The final CEQ *Guidance on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Review* is dispositive on the issue of federal agency review of greenhouse gas emissions as foreseeable direct and indirect effects of the proposed action. 81 Fed. Reg. 51,866 (Aug. 5, 2016). NEPA requires BLM to use available tools to evaluate environmental impacts. 40 C.F.R. § 1502.22(a). The CEQ guidance provides clear direction for BLM to conduct a lifecycle greenhouse gas analysis because the modeling and tools to conduct this type of analysis are readily available to the agency:

If the direct and indirect GHG emissions can be quantified based on available information, including reasonable projections and assumptions, agencies should consider and disclose the reasonably foreseeable direct and indirect emissions when analyzing the direct and indirect effects of the proposed action. Agencies should disclose the information and any assumptions used in the analysis and explain any uncertainties.

To compare a project's estimated direct and indirect emissions with GHG emissions from the no-action alternative, agencies should draw on existing, timely, objective, and authoritative analyses, such as those by the Energy Information Administration, the Federal Energy Management Program, or Office of Fossil Energy of the Department of Energy. In the absence of such analyses, agencies should use other available information.

CEQ NEPA Guidance at 16 (citations omitted).

CEQ's guidance even provides an example of where a lifecycle analysis is appropriate in a leasing context at footnote 42:

The indirect effects of such an action that are reasonably foreseeable at the time would vary with the circumstances of the proposed action. For actions such as a Federal lease

³ "CEQ NEPA Guidance" (Aug. 1, 2016), available at https://www.whitehouse.gov/sites/whitehouse.gov/files/documents/nepa_final_ghg_guidance.pdf.



sale of coal for energy production, the impacts associated with the end-use of the fossil fuel being extracted would be the reasonably foreseeable combustion of that coal.

Id.

The number of future wells and volume of potential oil and gas from these lease parcels are knowable and calculating the direct emissions impact from these lease parcels are also quantifiable.

Natural gas emissions are generally about 84 percent methane. Methane is a potent greenhouse gas that contributes substantially to global climate change. Its global warming potential is approximately 33 times that of carbon dioxide over a 100 year time frame and 105 times that of carbon dioxide over a 20 year time frame.⁴

Oil and gas operations release large amounts of methane. While the exact amount is not clear, EPA has estimated that “oil and gas systems are the largest human-made source of methane emissions and account for 37 percent of methane emissions in the United States or 3.8 percent of the total greenhouse gas emissions in the United States.”⁵ For natural gas operations, production generates the largest amount; however, these emissions occur in all sectors of the natural gas industry, from drilling and production, to processing, transmission, and distribution.⁶ Fracked wells leak an especially large amount of methane, with some evidence indicating that the leakage rate is so high that shale gas is worse for the climate than coal.⁷ In fact, a research team associated with the National Oceanic and Atmospheric Administration recently reported that preliminary results from a field study in the Uinta Basin of Utah suggest that the field leaked methane at an eye-popping rate of nine percent of total production.⁸

For the oil industry, emissions result “primarily from field production operations . . . , oil storage tanks, and production-related equipment ”⁹ Emissions are released as planned, during normal operations

⁴ Howarth, Robert, et al., “Methane and the greenhouse-gas footprint of natural gas from shale formations,” *Climatic Change* (Mar. 31, 2011) (“Howarth 2011”); Shindell, Drew, “Improved Attribution of Climate Forcing to Emissions,” 326 *Science* 716 (2009).

⁵ U.S. Environmental Protection Agency, Natural Gas STAR Program, Basic Information, Major Methane Emission Sources and Opportunities to Reduce Methane Emissions (“USEPA, Basic Information”); *see also* Petron, Gabrielle, et al., “Hydrocarbon emissions characterization in the Colorado Front Range: A pilot study,” 117 *Journal of Geophysical Research* (2012).

⁶ USEPA, Basic Information.

⁷ Howarth 2011; Brune, Michael, Statement of Sierra Club Executive Director Michael Brune Before the Committee on Oversight & Government Reform (May 31, 2012); Wang, Jinsheng, et al., Reducing the Greenhouse Gas Footprint of Shale (2011); Alvarez, Ramon et al., Greater focus needed on methane leakage from natural gas infrastructure, Proc of Nat'l Acad. Science Early Edition (Feb. 13, 2012) at 3; *see also* Howarth, Robert, et al., Venting and Leaking of Methane from Shale Gas Development: Response to Cathles et al., (2012); Hou, Deyi, et al., Shale gas can be a double-edged sword for climate change, *Nature Climate Change* at 386 (2012)

⁸ Tollefson, Jeff, “Methane leaks erode green credentials of natural gas,” *Nature News* (Jan. 2, 2013).

⁹ Williams, Megan & Cindy Copeland, Earthjustice, Methane Controls for the Oil and Gas Production Sector (2010).



and unexpectedly due to leaks and system upsets.¹⁰ Significant sources of emissions include well venting and flaring, pneumatic devices, dehydrators and pumps, and compressors.¹¹

Contrary to CEQ's guidance, the EA improperly declines to analyze the contribution to climate change of additional Wyoming federal oil and gas leasing, instead disclaiming ability to evaluate those impacts by stating only

Several activities that occur in the area contribute to climate change, including: large wildfires, activities using combustion engines, changes to the natural carbon cycle, changes to radioactive forces and reflectivity, and emissions of greenhouse gases (GHGs). GHGs, including CO₂, as well as, methane (CH₄), nitrous oxide (N₂O), and fluorinated gases, are created and emitted through human activities, including oil and gas development, and agricultural activities. Without additional meteorological monitoring systems, it is difficult to determine spatial and temporal variability and change of climatic conditions, but increasing concentrations of GHGs are likely to accelerate the rate of climate change.

EA at 3-9.

The very purpose of oil and gas leasing is the production, and subsequent combustion, of hydrocarbon fossil fuels. It is simply not credible to assert in 2016 that BLM has no way of estimating a range of possible production levels for leases within established industry plays and currently producing geological formations. Although there are certainly geological, technological, and economic uncertainties that could affect the production from the leases in question, these uncertainties do not relieve BLM of the obligation to analyze and disclose, at the very least, a range of possible production scenarios and their resulting emissions. In its recent NEPA guidance, CEQ directs agencies, at a minimum, to "use projected GHG emissions as a proxy for assessing potential climate change effects when preparing a NEPA analysis for a proposed agency action." 81 Fed. Reg. 51,866, 51,866 (Aug. 5, 2016). BLM has failed to meet even this low bar in its climate analysis.

Further, BLM's analysis is lacking because the agency failed to identify numerous available methods for controlling air pollution emissions. This total failure violates NEPA's requirement that the agency identify mitigation measures, 40 C.F.R. § 1508.25, and consider all reasonable alternatives. *Center for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008) (citing 40 C.F.R. § 1502.14(a)).

III. The EA Fails to Acknowledge Scientific Information Regarding Conservation of Greater Sage-Grouse

Wyoming supports 35-40% of the entire population of greater sage-grouse and is a source population for the more isolated grouse populations in Montana and the Dakotas.¹² Since 2007, there has

¹⁰ *Id.*

¹¹ USEPA, Basic Information.



been an increase in the number of known inactive leks statewide, while the number of active leks has remained constant. At the same time, there has been a 60% decrease in the average number of males counted per lek statewide, indicating an overall statewide population decline of 60% from 2007 to 2013. This is cause for extreme concern, especially given the fact that there have been many wet springs during this period with above-average forb and cover production, which should have resulted in increases in sage grouse population numbers. This inadequacy is confirmed by Copeland et al. (2013), who projected further statewide declines across Wyoming with the implementation of current conservation strategies.¹³

The proposed lease sale, however, is particularly damaging to the future viability of greater sage-grouse because it would allow for new leasing of sage-grouse habitat both without site-specific analysis of impacts, and without complying with the Wyoming BLM's alleged strategy to prioritize leasing outside of both priority and general habitat. The entire proposed WRBB February 2017 falls within either General or Priority Habitat Management Areas, and about 4% within PHMA. EA at 3-21.

Despite that highly sensitive sage-grouse habitat would be threatened by new leasing, the EA fails in three major respects to disclose or analyze indirect and cumulative impacts of leasing on greater sage-grouse. It tiers to and relies on RMP decisions for management of Wyoming greater sage-grouse habitat that fail to follow the best available science regarding measures necessary to ensure the survival and recovery of the species. The proposed leasing action, moreover, violates FLPMA by failing to conform to a key management prescription of those plans – the obligation to “prioritize the leasing and development of fluid mineral resources outside GRSG habitat.” Furthermore, because the proposed leases are not in conformance with the 2015 RMP amendments and undermine significant assumptions of their accompanying FEISs (i.e., that new oil and gas development will tend to occur outside of greater sage-grouse habitat), the EA cannot tier to or rely on those EISs.

A. BLM's Proposed Alternative Does Not Conform with BLM Wyoming's Sage-Grouse Conservation Strategy

Even under the BLM's own determinations, the proposed action is directly in conflict with a core provision of the 2015 sage-grouse RMP amendments. All the Rocky Mountain Region RMPs are subject to the following measure for both priority and general habitat management areas:

Prioritization Objective—In addition to allocations that limit disturbance in PHMAs and GHMAs, the ARMPs and ARMPAs prioritize oil and gas leasing and development outside of identified PHMAs and GHMAs. This is to further limit future surface disturbance and encourage new development in areas that would not conflict with GRSG. This objective is intended to guide development to lower conflict areas and as such protect important habitat and reduce the time and cost associated with oil and gas leasing

¹² See Upper Snake River Basin Sage---Grouse Conservation Plan. 2014 (draft), available at http://wgfd.wyo.gov/web2011/Departments/Wildlife/pdfs/SG_USRBASIN_DRAFT0005199.pdf.

¹³ Copeland, H. E., A. Pocewicz, D. E. Naugle, T. Griffiths, D. Keinath, J. Evans, J. Platt. 2013. Measuring the effectiveness of conservation: a novel framework to quantify the benefits of sage-grouse conservation policy and easements in Wyoming. PLoS ONE 8(6): e67261. doi:10.1371/journal.pone.0067261.



development by avoiding sensitive areas, reducing the complexity of environmental review and analysis of potential impacts on sensitive species, and decreasing the need for compensatory mitigation.¹⁴

The EA explicitly acknowledges that its greater sage-grouse conservation plans and strategy “direct the BLM to prioritize oil and gas leasing and development in a manner that minimizes resource conflicts in order to protect important habitat and reduce development time and costs.” EA at 1-3 to 1-4. The EA fails to explain the rationale for deferring three parcels containing priority and/or general habitat management areas but including ten parcels that fall completely within sage-grouse PHMA or GHMA.

The BLM is subject to clear direction in the RMP amendments that its greater sage-grouse RMP plans and conservation strategy rely not only on stipulations within designated habitats (stipulations acknowledged as insufficient, in Wyoming, to result in a net conservation gain for general habitat, *see* 2015 RMPA ROD at 1-30 to 1-31, but also on a larger strategy of prioritizing development outside of all sage-grouse habitats. Despite its acknowledgement of the prioritization requirement by deferring three parcels, however, the BLM’s proposed action would consist entirely of general and priority habitat. It is simply impossible to understand how offering leases all within sage-grouse habitat is consistent with the RMP requirement to prioritize leasing outside such habitat, and the EA provides no rationale for this decision.

An apparent BLM policy of leasing parcels all within sage-grouse habitat is not only inconsistent with the RMPs and FLPMA’s consistency requirement, it also undermines a fundamental assumption of the RMP Amendment EISs – as well as the U.S. Fish and Wildlife Service’s determination that listing the greater sage-grouse under the Endangered Species Act was “not warranted.” That assumption is that the measures adopted in the RMP Amendments will result in oil and gas development tending to occur outside of greater sage-grouse habitat. Proposing a lease sale for ten parcels containing sage-grouse habitat (including one that contains “Priority Habitat Management Area”) shortly following the finalization of the sage-grouse RMPs strongly undermines that assumption. It further undermines the assumption in the Fish and Wildlife Service’s “not warranted” finding for the greater sage-grouse that federal and state implementation of the “Wyoming Plan” for fluid minerals will continue the 2012-15 trend of reduced drilling within core areas. If BLM is not actually going to give meaningful content to its plan direction to prioritize leasing outside of sage-grouse habitats, it cannot rely on FEISs, such as the Wyoming Sage Grouse RMP FEIS, that assume the effectiveness of that plan direction.

B. The BLM Fails to Consider Reasonable Alternatives Prioritizing Leasing Outside of All Designated Sage-Grouse Habitat

The “heart” of NEPA is an agency’s obligation, in evaluating the environmental impacts of its actions, whether by EA or EIS, to consider all reasonable alternatives to those actions. *See Center. for Biological Diversity v. Nat’l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008) (citing 40 C.F.R. § 1502.14(a)). The High Plains District February 2017 leasing EA fails to meet this core NEPA obligation by arbitrarily excluding from consideration any alternative that could meaningfully

¹⁴ 2015 Rocky Mountain RMP ROD at 1-25.



preserve BLM Wyoming offices' authority to adopt effective and scientifically credible conservation measures for greater sage-grouse.

The Wind River/Bighorn Basin District February 2017 leasing EA considers only the no-action and proposed alternatives. The EA does not even consider an alternative, regularly considered and adopted by other field offices, would defer all remaining parcels located within sage grouse "Priority Habitat Management Areas" and "General Habitat Management Areas," at least until such time as BLM completes a strategy for the implementation of the sage-grouse RMP amendments. We request that BLM give consideration to such a habitat prioritization alternative.

Agencies may not reject an otherwise reasonable alternative out of hand simply because it shares some characteristics with the no-action alternative. *See Colorado Environmental Coalition v. Salazar*, 875 F. Supp.2d 1233, 1248-50 (D. Colo. 2012). Such an alternative would be consistent with BLM Instruction Memorandum IM WY-2012-019 at 8, which states:

This policy does not preclude the development and immediate implementation of new, or innovative mitigation, or other conservation measures that would be expected to reduce activity/project impacts to sage-grouse and their habitats.

IV. Conclusion

Due to the deficiencies documented in these comments, the Center requests:

1. That a Finding of No Significant Impact not be issued, and that the BLM initiate the process for preparing an environmental impact statement prior to authorizing any further leasing.
2. That the BLM defer all future sales within greater sage-grouse habitat until at least such time as it issues final implementation guidance for the sage-grouse RMP amendments, including the requirement to prioritize leasing outside of Priority and General Habitat Management Areas.
3. That any further consideration of potential leasing within greater sage-grouse habitat consider not only leasing, but also deferral and or withdrawal, under FLPMA § 204, of said habitat from further leasing, consistent with the best available science regarding greater sage-grouse conservation.

Thank you for consideration of these comments. The Center looks forward to reviewing a legally adequate EIS for this proposed oil and gas leasing action. Sincerely,

/s/ Michael A. Saul

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2101 Webster St., Suite 1300
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From: Michael Saul
To: blm_wy_wrbdd_lease@blm.gov
Cc: katie.schaefer@sierraclub.org; "Shelley Silbert"; Michael Saul; Diana Dascalu-Joffe
Subject: February 2017 lease sale parcels
Date: Wednesday, August 24, 2016 6:25:37 PM
Attachments: [CBD et al Comments Wyoming Feb 2017 WRBB Lease Sale 8-24-16.pdf](#)

Ms. Allen,

Please find attached the comments of the Center for Biological Diversity, Great Old Broads for Wilderness, and the Sierra Club on the Wind River/Bighorn Basin District's Environmental Assessment for its proposed February 2017 oil and gas lease sale.

Sincerely,

Michael Saul

Senior Attorney, Public Lands

Center for Biological Diversity

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Rita Allen
Bureau of Land Management
Wind River/Bighorn Basin District Office
101 South 23rd Street
Worland, WY 82401
Via email to: blm_wy_wrbdd_lease@blm.gov

August 24, 2016

RE: February 2017 Lease Parcels
Comments of the Center for Biological Diversity et al. on the Environmental Assessment for the High Plains District

Ms. Allen:

I am submitting these comments on behalf of the Center for Biological Diversity, Great Old Broads for Wilderness, and the Sierra Club, on the Environmental Assessment (“EA”) for the February 2017 Competitive Lease Sale for the Wind River/Bighorn Basin District.

The Center for Biological Diversity is a non-profit environmental organization dedicated to the protection of native species and their habitats through science, policy, and environmental law. The Center also works to reduce greenhouse gas emissions to protect biological diversity, our environment, and public health. The Center has over 1.1 million members and on-line activists, including those living in Wyoming who have visited these public lands in the High Plains District for recreational, scientific, educational, and other pursuits and intend to continue to do so in the future, and are particularly interested in protecting the many native, imperiled, and sensitive species and their habitats that may be affected by the proposed oil and gas leasing.

Great Old Broads for Wilderness (Broads) is a national non-profit organization with over 8,000 members and advocates, working to engage and ignite the activism of elders to preserve and protect wilderness and wild lands. Conceived by older women who love wilderness, Broads gives voice to the millions of older Americans who want to protect their public lands as Wilderness for this and future generations. Broads believes that public lands should be part of the solution to climate change, not part of the problem.

The Sierra Club is a national nonprofit organization of approximately 625,000 members dedicated to exploring, enjoying, and protecting the wild places of the earth; to practicing and promoting the responsible use of the earth’s ecosystems and resources; to educating and enlisting humanity to protect and restore the quality of the natural and human environment; and to using all lawful means to carry out these objectives. Sierra Club members use the public lands in Wyoming, including the lands and waters that would be affected by the increased oil and gas development proposed under the lease sale, for quiet recreation, aesthetic pursuits, and spiritual renewal.



For the reasons set forth below, this EA does not satisfy the requirements of NEPA, and the proposed lease sale would therefore violate the National Environmental Policy Act (“NEPA”), the Mineral Leasing Act (“MLA”), the Federal Lands Policy and Management Act (“FLPMA”), and the Endangered Species Act. BLM should produce a full Environmental Impact Statement (“EIS”) for the lease sale. In particular, BLM’s EA for the proposed lease sale, fails to comply with NEPA’s obligation to consider indirect and cumulative impacts, including impacts from climate change, fails to meet its obligations to consider foreseeable environmental impacts to greater sage-grouse, including consideration of relevant and readily available scientific information.

I. The EA Improperly Limits its Analysis of Reasonably Foreseeable Environmental Impacts

NEPA demands that a federal agency prepare an EIS before taking a “major [f]ederal action[] significantly affecting the quality’ of the environment.” *Kern v. U.S. Bureau of Land Mgmt.*, 284 F.3d 1062, 1067 (9th Cir. 2002). In order to determine whether a project’s impacts may be “significant,” an agency may first prepare an EA. 40 C.F.R. §§ 1501.4, 1508.9. If the EA reveals that “the agency’s action may have a significant effect upon the . . . environment, an EIS must be prepared.” *Nat’l Parks & Conservation Ass’n v. Babbitt*, 241 F.3d 722, 730 (9th Cir. 2001) (internal quotations omitted). If the agency determines that no significant impacts are possible, it must still adequately explain its decision by supplying a “convincing statement of reasons” why the action’s effects are insignificant. *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1212 (9th Cir. 1998). Further, an agency must prepare all environmental analyses required by NEPA at “the earliest possible time.” 40 C.F.R. § 1501.2. “NEPA is not designed to postpone analysis of an environmental consequence to the last possible moment,” but is “designed to require such analysis as soon as it can reasonably be done.” *Kern*, 284 F.3d at 1072.

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Taken together, [*Park County* and *Pennaco Energy*] establish that there is no bright line rule that site-specific analysis may wait until the APD stage. Instead, the inquiry is necessarily contextual. Looking to the standards set out by regulation and by statute, assessment of all “reasonably foreseeable” impacts must occur at the earliest practicable point, and must take place before an “irretrievable commitment of resources” is made. 42 U.S.C. § 4332(2)(C)(v); *Pennaco Energy*, 377 F.3d at 1160; *Kern*, 284 F.3d at 1072; 40 C.F.R. §§ 1501.2, 1502.22. Each of these inquiries is tied to the existing environmental circumstances, not to the formalities of agency procedures. Thus, applying them necessarily requires a fact-specific inquiry.

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oil and gas leasing operations, based on rationales that have been conclusively rejected in final guidance from the Council on Environmental Quality, NEPA's implementing body.

A. BLM Has Failed to Analyze Adequately the Project's Climate Change Impacts

NEPA's environmental analysis requirement includes consideration of climate change. *See Center v. NHTSA*, 538 F.3d at 12-1216-17. Oil and gas operations are a major contributing factor to climate change, due both to emissions from the operations themselves and emissions from the combustion of the oil and gas produced. BLM's continued refusal to address the life-cycle greenhouse gas (GHG) emissions of fossil fuel production, transport, processing, and combustion from public lands is contrary to NEPA, and squarely contrary to the Council on Environmental Quality's recently finalized Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews.³

The final CEQ *Guidance on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Review* is dispositive on the issue of federal agency review of greenhouse gas emissions as foreseeable direct and indirect effects of the proposed action. 81 Fed. Reg. 51,866 (Aug. 5, 2016). NEPA requires BLM to use available tools to evaluate environmental impacts. 40 C.F.R. § 1502.22(a). The CEQ guidance provides clear direction for BLM to conduct a lifecycle greenhouse gas analysis because the modeling and tools to conduct this type of analysis are readily available to the agency:

If the direct and indirect GHG emissions can be quantified based on available information, including reasonable projections and assumptions, agencies should consider and disclose the reasonably foreseeable direct and indirect emissions when analyzing the direct and indirect effects of the proposed action. Agencies should disclose the information and any assumptions used in the analysis and explain any uncertainties.

To compare a project's estimated direct and indirect emissions with GHG emissions from the no-action alternative, agencies should draw on existing, timely, objective, and authoritative analyses, such as those by the Energy Information Administration, the Federal Energy Management Program, or Office of Fossil Energy of the Department of Energy. In the absence of such analyses, agencies should use other available information.

CEQ NEPA Guidance at 16 (citations omitted).

CEQ's guidance even provides an example of where a lifecycle analysis is appropriate in a leasing context at footnote 42:

The indirect effects of such an action that are reasonably foreseeable at the time would vary with the circumstances of the proposed action. For actions such as a Federal lease

³ "CEQ NEPA Guidance" (Aug. 1, 2016), available at https://www.whitehouse.gov/sites/whitehouse.gov/files/documents/nepa_final_ghg_guidance.pdf.



sale of coal for energy production, the impacts associated with the end-use of the fossil fuel being extracted would be the reasonably foreseeable combustion of that coal.

Id.

The number of future wells and volume of potential oil and gas from these lease parcels are knowable and calculating the direct emissions impact from these lease parcels are also quantifiable.

Natural gas emissions are generally about 84 percent methane. Methane is a potent greenhouse gas that contributes substantially to global climate change. Its global warming potential is approximately 33 times that of carbon dioxide over a 100 year time frame and 105 times that of carbon dioxide over a 20 year time frame.⁴

Oil and gas operations release large amounts of methane. While the exact amount is not clear, EPA has estimated that “oil and gas systems are the largest human-made source of methane emissions and account for 37 percent of methane emissions in the United States or 3.8 percent of the total greenhouse gas emissions in the United States.”⁵ For natural gas operations, production generates the largest amount; however, these emissions occur in all sectors of the natural gas industry, from drilling and production, to processing, transmission, and distribution.⁶ Fracked wells leak an especially large amount of methane, with some evidence indicating that the leakage rate is so high that shale gas is worse for the climate than coal.⁷ In fact, a research team associated with the National Oceanic and Atmospheric Administration recently reported that preliminary results from a field study in the Uinta Basin of Utah suggest that the field leaked methane at an eye-popping rate of nine percent of total production.⁸

For the oil industry, emissions result “primarily from field production operations . . . , oil storage tanks, and production-related equipment”⁹ Emissions are released as planned, during normal operations

⁴ Howarth, Robert, et al., “Methane and the greenhouse-gas footprint of natural gas from shale formations,” *Climatic Change* (Mar. 31, 2011) (“Howarth 2011”); Shindell, Drew, “Improved Attribution of Climate Forcing to Emissions,” 326 *Science* 716 (2009).

⁵ U.S. Environmental Protection Agency, Natural Gas STAR Program, Basic Information, Major Methane Emission Sources and Opportunities to Reduce Methane Emissions (“USEPA, Basic Information”); *see also* Petron, Gabrielle, et al., “Hydrocarbon emissions characterization in the Colorado Front Range: A pilot study,” 117 *Journal of Geophysical Research* (2012).

⁶ USEPA, Basic Information.

⁷ Howarth 2011; Brune, Michael, Statement of Sierra Club Executive Director Michael Brune Before the Committee on Oversight & Government Reform (May 31, 2012); Wang, Jinsheng, et al., Reducing the Greenhouse Gas Footprint of Shale (2011); Alvarez, Ramon et al., Greater focus needed on methane leakage from natural gas infrastructure, Proc of Nat'l Acad. Science Early Edition (Feb. 13, 2012) at 3; *see also* Howarth, Robert, et al., Venting and Leaking of Methane from Shale Gas Development: Response to Cathles et al., (2012); Hou, Deyi, et al., Shale gas can be a double-edged sword for climate change, *Nature Climate Change* at 386 (2012)

⁸ Tollefson, Jeff, “Methane leaks erode green credentials of natural gas,” *Nature News* (Jan. 2, 2013).

⁹ Williams, Megan & Cindy Copeland, Earthjustice, Methane Controls for the Oil and Gas Production Sector (2010).



and unexpectedly due to leaks and system upsets.¹⁰ Significant sources of emissions include well venting and flaring, pneumatic devices, dehydrators and pumps, and compressors.¹¹

Contrary to CEQ's guidance, the EA improperly declines to analyze the contribution to climate change of additional Wyoming federal oil and gas leasing, instead disclaiming ability to evaluate those impacts by stating only

Several activities that occur in the area contribute to climate change, including: large wildfires, activities using combustion engines, changes to the natural carbon cycle, changes to radioactive forces and reflectivity, and emissions of greenhouse gases (GHGs). GHGs, including CO₂, as well as, methane (CH₄), nitrous oxide (N₂O), and fluorinated gases, are created and emitted through human activities, including oil and gas development, and agricultural activities. Without additional meteorological monitoring systems, it is difficult to determine spatial and temporal variability and change of climatic conditions, but increasing concentrations of GHGs are likely to accelerate the rate of climate change.

EA at 3-9.

The very purpose of oil and gas leasing is the production, and subsequent combustion, of hydrocarbon fossil fuels. It is simply not credible to assert in 2016 that BLM has no way of estimating a range of possible production levels for leases within established industry plays and currently producing geological formations. Although there are certainly geological, technological, and economic uncertainties that could affect the production from the leases in question, these uncertainties do not relieve BLM of the obligation to analyze and disclose, at the very least, a range of possible production scenarios and their resulting emissions. In its recent NEPA guidance, CEQ directs agencies, at a minimum, to "use projected GHG emissions as a proxy for assessing potential climate change effects when preparing a NEPA analysis for a proposed agency action." 81 Fed. Reg. 51,866, 51,866 (Aug. 5, 2016). BLM has failed to meet even this low bar in its climate analysis.

Further, BLM's analysis is lacking because the agency failed to identify numerous available methods for controlling air pollution emissions. This total failure violates NEPA's requirement that the agency identify mitigation measures, 40 C.F.R. § 1508.25, and consider all reasonable alternatives. *Center for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008) (citing 40 C.F.R. § 1502.14(a)).

III. The EA Fails to Acknowledge Scientific Information Regarding Conservation of Greater Sage-Grouse

Wyoming supports 35-40% of the entire population of greater sage-grouse and is a source population for the more isolated grouse populations in Montana and the Dakotas.¹² Since 2007, there has

¹⁰ *Id.*

¹¹ USEPA, Basic Information.



been an increase in the number of known inactive leks statewide, while the number of active leks has remained constant. At the same time, there has been a 60% decrease in the average number of males counted per lek statewide, indicating an overall statewide population decline of 60% from 2007 to 2013. This is cause for extreme concern, especially given the fact that there have been many wet springs during this period with above-average forb and cover production, which should have resulted in increases in sage grouse population numbers. This inadequacy is confirmed by Copeland et al. (2013), who projected further statewide declines across Wyoming with the implementation of current conservation strategies.¹³

The proposed lease sale, however, is particularly damaging to the future viability of greater sage-grouse because it would allow for new leasing of sage-grouse habitat both without site-specific analysis of impacts, and without complying with the Wyoming BLM's alleged strategy to prioritize leasing outside of both priority and general habitat. The entire proposed WRBB February 2017 falls within either General or Priority Habitat Management Areas, and about 4% within PHMA. EA at 3-21.

Despite that highly sensitive sage-grouse habitat would be threatened by new leasing, the EA fails in three major respects to disclose or analyze indirect and cumulative impacts of leasing on greater sage-grouse. It tiers to and relies on RMP decisions for management of Wyoming greater sage-grouse habitat that fail to follow the best available science regarding measures necessary to ensure the survival and recovery of the species. The proposed leasing action, moreover, violates FLPMA by failing to conform to a key management prescription of those plans – the obligation to “prioritize the leasing and development of fluid mineral resources outside GRSG habitat.” Furthermore, because the proposed leases are not in conformance with the 2015 RMP amendments and undermine significant assumptions of their accompanying FEISs (i.e., that new oil and gas development will tend to occur outside of greater sage-grouse habitat), the EA cannot tier to or rely on those EISs.

A. BLM's Proposed Alternative Does Not Conform with BLM Wyoming's Sage-Grouse Conservation Strategy

Even under the BLM's own determinations, the proposed action is directly in conflict with a core provision of the 2015 sage-grouse RMP amendments. All the Rocky Mountain Region RMPs are subject to the following measure for both priority and general habitat management areas:

Prioritization Objective—In addition to allocations that limit disturbance in PHMAs and GHMAs, the ARMPs and ARMPAs prioritize oil and gas leasing and development outside of identified PHMAs and GHMAs. This is to further limit future surface disturbance and encourage new development in areas that would not conflict with GRSG. This objective is intended to guide development to lower conflict areas and as such protect important habitat and reduce the time and cost associated with oil and gas leasing

¹² See Upper Snake River Basin Sage---Grouse Conservation Plan. 2014 (draft), available at http://wgfd.wyo.gov/web2011/Departments/Wildlife/pdfs/SG_USRBASIN_DRAFT0005199.pdf.

¹³ Copeland, H. E., A. Pocewicz, D. E. Naugle, T. Griffiths, D. Keinath, J. Evans, J. Platt. 2013. Measuring the effectiveness of conservation: a novel framework to quantify the benefits of sage-grouse conservation policy and easements in Wyoming. PLoS ONE 8(6): e67261. doi:10.1371/journal.pone.0067261.



development by avoiding sensitive areas, reducing the complexity of environmental review and analysis of potential impacts on sensitive species, and decreasing the need for compensatory mitigation.¹⁴

The EA explicitly acknowledges that its greater sage-grouse conservation plans and strategy “direct the BLM to prioritize oil and gas leasing and development in a manner that minimizes resource conflicts in order to protect important habitat and reduce development time and costs.” EA at 1-3 to 1-4. The EA fails to explain the rationale for deferring three parcels containing priority and/or general habitat management areas but including ten parcels that fall completely within sage-grouse PHMA or GHMA.

The BLM is subject to clear direction in the RMP amendments that its greater sage-grouse RMP plans and conservation strategy rely not only on stipulations within designated habitats (stipulations acknowledged as insufficient, in Wyoming, to result in a net conservation gain for general habitat, *see* 2015 RMPA ROD at 1-30 to 1-31, but also on a larger strategy of prioritizing development outside of all sage-grouse habitats. Despite its acknowledgement of the prioritization requirement by deferring three parcels, however, the BLM’s proposed action would consist entirely of general and priority habitat. It is simply impossible to understand how offering leases all within sage-grouse habitat is consistent with the RMP requirement to prioritize leasing outside such habitat, and the EA provides no rationale for this decision.

An apparent BLM policy of leasing parcels all within sage-grouse habitat is not only inconsistent with the RMPs and FLPMA’s consistency requirement, it also undermines a fundamental assumption of the RMP Amendment EISs – as well as the U.S. Fish and Wildlife Service’s determination that listing the greater sage-grouse under the Endangered Species Act was “not warranted.” That assumption is that the measures adopted in the RMP Amendments will result in oil and gas development tending to occur outside of greater sage-grouse habitat. Proposing a lease sale for ten parcels containing sage-grouse habitat (including one that contains “Priority Habitat Management Area”) shortly following the finalization of the sage-grouse RMPs strongly undermines that assumption. It further undermines the assumption in the Fish and Wildlife Service’s “not warranted” finding for the greater sage-grouse that federal and state implementation of the “Wyoming Plan” for fluid minerals will continue the 2012-15 trend of reduced drilling within core areas. If BLM is not actually going to give meaningful content to its plan direction to prioritize leasing outside of sage-grouse habitats, it cannot rely on FEISs, such as the Wyoming Sage Grouse RMP FEIS, that assume the effectiveness of that plan direction.

B. The BLM Fails to Consider Reasonable Alternatives Prioritizing Leasing Outside of All Designated Sage-Grouse Habitat

The “heart” of NEPA is an agency’s obligation, in evaluating the environmental impacts of its actions, whether by EA or EIS, to consider all reasonable alternatives to those actions. *See Center. for Biological Diversity v. Nat’l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008) (citing 40 C.F.R. § 1502.14(a)). The High Plains District February 2017 leasing EA fails to meet this core NEPA obligation by arbitrarily excluding from consideration any alternative that could meaningfully

¹⁴ 2015 Rocky Mountain RMP ROD at 1-25.



preserve BLM Wyoming offices' authority to adopt effective and scientifically credible conservation measures for greater sage-grouse.

The Wind River/Bighorn Basin District February 2017 leasing EA considers only the no-action and proposed alternatives. The EA does not even consider an alternative, regularly considered and adopted by other field offices, would defer all remaining parcels located within sage grouse "Priority Habitat Management Areas" and "General Habitat Management Areas," at least until such time as BLM completes a strategy for the implementation of the sage-grouse RMP amendments. We request that BLM give consideration to such a habitat prioritization alternative.

Agencies may not reject an otherwise reasonable alternative out of hand simply because it shares some characteristics with the no-action alternative. *See Colorado Environmental Coalition v. Salazar*, 875 F. Supp.2d 1233, 1248-50 (D. Colo. 2012). Such an alternative would be consistent with BLM Instruction Memorandum IM WY-2012-019 at 8, which states:

This policy does not preclude the development and immediate implementation of new, or innovative mitigation, or other conservation measures that would be expected to reduce activity/project impacts to sage-grouse and their habitats.

IV. Conclusion

Due to the deficiencies documented in these comments, the Center requests:

1. That a Finding of No Significant Impact not be issued, and that the BLM initiate the process for preparing an environmental impact statement prior to authorizing any further leasing.
2. That the BLM defer all future sales within greater sage-grouse habitat until at least such time as it issues final implementation guidance for the sage-grouse RMP amendments, including the requirement to prioritize leasing outside of Priority and General Habitat Management Areas.
3. That any further consideration of potential leasing within greater sage-grouse habitat consider not only leasing, but also deferral and or withdrawal, under FLPMA § 204, of said habitat from further leasing, consistent with the best available science regarding greater sage-grouse conservation.

Thank you for consideration of these comments. The Center looks forward to reviewing a legally adequate EIS for this proposed oil and gas leasing action. Sincerely,

/s/ Michael A. Saul

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From: Michael Freeman
To: ["WRNFleases@blm.gov"](mailto:WRNFleases@blm.gov)
Cc: [Peter Hart](#); [Joel Minor](#)
Subject: Comments on FEIS for 65 Improperly Issued Leases in White River National Forest
Date: Friday, September 2, 2016 10:48:44 AM
Attachments: [FINAL FEIS comments.pdf](#)

Attached please find comments on the Final EIS for the 65 existing leases in the White River National Forest. These comments are submitted on behalf of Wilderness Workshop, the Sierra Club, Rocky Mountain Wild, Center for Biological Diversity, Natural Resources Defense Council, The Wilderness Society, Conservation Colorado, Great Old Broads for Wilderness, EcoFlight, High Country Conservation Advocates, Citizens for a Healthy Community, San Juan Citizens Alliance, Western Colorado Congress and WildEarth Guardians.

A paper copy of these comments, along with the appendix of exhibits, is also being submitted by overnight delivery.

Regards,

Mike Freeman

Michael Freeman

Staff Attorney

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September 2, 2016

Karl Mendonca
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BY ELECTRONIC MAIL
AND OVERNIGHT DELIVERY

**Re: Comments on Final Environmental Impact Statement regarding 65
improperly-issued leases on White River National Forest**

Dear Mr. Mendonca:

Please accept these comments on behalf of Wilderness Workshop, the Sierra Club, Rocky Mountain Wild, Center for Biological Diversity, Natural Resources Defense Council, The Wilderness Society, Conservation Colorado, Great Old Broads for Wilderness, EcoFlight, High Country Conservation Advocates, Citizens for a Healthy Community, San Juan Citizens Alliance, Western Colorado Congress and WildEarth Guardians (collectively, the Conservation Groups), regarding the Bureau of Land Management's (BLM) final Environmental Impact Statement (FEIS) addressing 65 improperly-issued oil and gas leases in the White River National Forest.

INTRODUCTION

The Conservation Groups appreciate and support BLM's plan to cancel 25 of the improperly-issued leases located in the Thompson Divide. That cancellation will correct the fundamental errors that occurred when these leases were issued, and which have prevented them from expiring. It also will protect a landscape that supports local ranchers, hunters and anglers, recreationists, and the businesses that depend on those existing uses. These natural resources, and social and economic uses, all are incompatible with oil and gas development.

Unfortunately, the FEIS's Preferred Alternative abandons most of BLM's earlier proposal to protect the other lands being considered. Just a few months ago, the draft EIS proposed to update stipulations on the 40 non-cancelled leases to conform with the current White River National Forest land and resource management plan (the Forest Plan). That plan would have added protections for roadless lands, wildlife habitat, water, plants and soils. More than 60,000 public commenters—more than 99 percent of the comments BLM received—asked that these lands be protected, and that the final decision go even further by cancelling all of the leases.

BLM, however, has disregarded the broad public support for protecting these lands. Instead, the Preferred Alternative would reaffirm 27 of the leases with no changes addressing

Mr. Mendonca
Colorado River Valley Field Office Manager
September 2, 2016
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roadless areas, or protecting wildlife habitat, rivers and streams and other natural resources. In effect, BLM now proposes to repeat the same mistakes it made when it improperly issued these leases in the first place. Such a decision would be arbitrary and capricious and contrary to law.

While the 27 leases have received less media attention than the Thompson Divide, the lands they cover are no less important. These leases overlap with numerous inventoried roadless areas and habitat for a variety of wildlife. If BLM does not cancel all 65 leases (FEIS Alternative 5), it should at a minimum return to its earlier proposal and adopt FEIS Alternative 4 for the 40 non-cancelled leases. We appreciate the challenges the agency faces in making a decision of this scope, but adding such protective stipulations on all 40 leases is warranted by conditions on the ground and the applicable legal and policy framework.

The FEIS shows, in fact, that applying Alternative 4 stipulations to the non-cancelled leases will have no effect on oil and gas production. See FEIS at 2-104 to 2-105 (outside of Zone 3 (where the 25 leases would be cancelled) production is identical under Alternatives 1–4 and the Preferred Alternative). Given that assessment, there is no reason BLM should leave these lands without adequate protections.

DISCUSSION

I. BLM SHOULD CANCEL THE 25 LEASES AS PROPOSED IN THE FEIS.

As an initial matter, we strongly support the Preferred Alternative’s cancellation of the 25 leases held by SG Interests and Ursa Piceance, LLC. These leases are void ab initio because they were issued in violation of the law. Comments by Wilderness Workshop, et al. on Draft Environmental Impact Statement at 6–23 (Jan. 8, 2016) (DEIS Comments). Moreover, these leases—which were issued in 2003 and have never been brought into production—should have expired in 2013. These leases only remain in effect because they were improperly suspended in 2013, and again in 2014 and 2016. Cancelling the leases now is necessary to correct these errors and conform to the current Forest Plan. This step will allow the Forest Service and BLM to work from a clean slate in managing these lands.

Contrary to industry rhetoric, the law is clear that BLM has authority to cancel the leases, which were improperly issued in violation of NEPA, the Endangered Species Act, the Federal Onshore Oil and Gas Leasing Reform Act (FOOGLRA) and the Forest Service roadless area conservation rule (the Roadless Rule). “[T]he Secretary of the Interior has the authority to cancel any oil and gas lease issued contrary to law because of the inadvertence of his subordinates.” Celeste C. Grynberg, 169 IBLA 178, 183 (2006), aff’d sub nom, Grynberg v. Kempthorne, No. 06-cv-01878-WYD-MJW, 2008 WL 2445564 (D. Colo. June 16, 2008). More than 50 years ago, the Supreme Court held that the Interior Department has inherent authority to cancel leases administratively when they were issued improperly or in error. Boesche v. Udall, 373 U.S. 472, 476 (1963). This authority has been codified in BLM’s regulations, which provide that “[l]eases shall be subject to cancellation if improperly issued.” 43 C.F.R. § 3108.3(d). As the IBLA recently noted, “[t]here is no question that BLM has the authority to hold a lease to

have been improvidently issued when it has acted contrary to law, and to administratively cancel such a lease.” Atchee CBM, LLC, 183 IBLA 389, 412 n.27 (2013).

We incorporate by reference the discussion of BLM’s authority to cancel the leases from our January 8, 2016 comments on the draft EIS. See DEIS Comments at 6–23.

II. BLM MUST ADOPT FEIS ALTERNATIVE FIVE AND CANCEL ALL 65 LEASES.

Unfortunately, BLM’s treatment of the remaining 40 leases in the FEIS Preferred Alternative fails to comply with the law. These leases suffer from the same legal defects as the 25 cancelled leases, and as a result are void. Selecting Alternative 5 (cancellation of all 65 leases) is necessary under Tenth Circuit precedent and the U.S. Constitution.

The 65 leases must be cancelled because violations of NEPA and other laws rendered them void ab initio. BLM, in fact, has already recognized this point in connection with the Interior Board of Land Appeals (IBLA) proceedings that gave rise to this NEPA process. In Board of Commissioners of Pitkin County, 173 IBLA 173 (2007), the IBLA ruled that leases sold under identical circumstances to those here violated NEPA and the ESA. Id. at 184, 187. Following that decision, BLM acknowledged that the leases in that case were “invalid ab initio” because of the NEPA and ESA violations. It therefore withdrew the leases effective from their date of issuance and refunded the company’s rental and bonus payments for the leases. Letter from Karen Zurek, BLM, to Encana Oil & Gas (USA), Inc. (Aug. 12, 2009) (DEIS Comments Appx. 648–49); see also DEIS Comments Appx. 1004–1012 (cancelling parts of leases that were improperly issued on Forest Service lands unavailable for leasing at Sunlight Ski Area). The same result is necessary here.

In its FEIS, BLM takes the position that because NEPA is procedural, leases issued in violation of that statute are only “voidable” at the agency’s discretion rather than void. FEIS at 1-8; see also Clayton W. Williams, Jr., 103 IBLA 192, 210 (1988). This position disregards the violations of non-NEPA statutes like the ESA and FOOGLRA.¹ But even as to NEPA, Tenth Circuit precedent and the U.S. Constitution’s Property Clause require a different result.

In Sangre de Cristo Dev. Co. v. United States, 932 F.2d 891 (10th Cir. 1991), the Tenth Circuit analyzed statutory language providing that Indian lands could be leased “with the approval of the Secretary of the Interior.” Id. at 894. Where the Interior Department failed to comply with NEPA, however, the agency was “without authority to grant [approval for] the lease.” Id. (quoting Davis v. Morton, 469 F.2d 593, 594 (10th Cir. 1972)). Accordingly, the Tenth Circuit held that without NEPA compliance there was no valid approval and no valid

¹ Moreover, several of the cancelled leases were improperly issued in violation of 16 U.S.C § 497c(j), which withdraws all lands within the boundaries of ski area permits from mineral leasing.

lease—instead, the lessee’s “leasehold interest . . . never vested in the first place.” Id. at 895. Similarly, a federal court recently held that where an agency failed to comply with NEPA, its “approval of [an oil and gas] lease was invalid, [and] the lease is not now and has never been legally operative.” Hayes v. Chaparral Energy, LLC, No. 14-cv-495-GKF-PJC, ___ F. Supp. 3d ___, 2016 WL 1254427, *6 (N.D. Okla. Mar. 29, 2016); see also Shoshone Indian Tribe v. United States, 672 F.3d 1021, 1037–38 (Fed. Cir. 2012) (failure to strictly comply with the procedural requirements for approving Indian lease “renders any resulting conveyance void”).

The same result applies to the leases here. The Property Clause of the U.S. Constitution allows federal agencies to “alienate interests in land belonging to the United States only within the limits authorized by law.” Union Oil Co. of Cal. v. Morton, 512 F.2d 743, 748 (9th Cir. 1975) (discussing offshore oil and gas leases); accord U.S. Const. art. IV, § 3, cl. 2. Agencies have authority to transfer interests in federal property only when they “follow strictly the dictates of” congressional statutes. Kidd v. Dep’t of Interior, 756 F.2d 1410, 1412 (9th Cir. 1985); see also Rio Grande Silvery Minnow v. Bureau of Reclamation, 599 F.3d 1165, 1185–86 (10th Cir. 2010) (government official cannot disclaim or abandon property without congressional authorization).

The theory that improperly-issued leases are merely “voidable” is inconsistent with Tenth Circuit precedent and the Property Clause. Even where statutes are merely “procedural,” property interests issued in violation of those statutes are void and outside the agency’s authority. BLM cannot decide to excuse its violation of NEPA or other procedural statutes by treating them as “voidable” and reaffirming improperly-issued leases after the fact. Because BLM failed to comply with the requirements of Congress before issuing them, the leases are simply void.

Moreover, the FEIS maintains the same dismissive view of Alternative 5 that BLM took in its draft EIS, stating that the alternative is included in the EIS “primarily to facilitate a full range of analysis.” FEIS at 2-64. This approach wrongly biases BLM’s process toward an outcome that will harm the Conservation Groups and many members of the public by leaving in place dozens of improperly-issued leases. See Davis v. Mineta, 302 F.3d 1104, 1115 n.7 (10th Cir. 2002) (enjoining agency in order to avoid “a serious risk” that past actions would bias NEPA analysis); Colo. Wild, Inc. v. U.S. Forest Serv., 523 F. Supp. 2d 1213, 1220–21 (D. Colo. 2007) (enjoining agency to prevent prior decision made in violation of NEPA from “skew[ing] the analysis and decision-making of the Forest Service [when reconsidering that decision] towards its original, non-NEPA compliant access decision”). The fundamental purpose of the NEPA analysis is to reconsider BLM’s earlier decision to issue the leases. 79 Fed. Reg. 18,576, 18,577 (Apr. 2, 2014). NEPA requires consideration of alternatives, and the reasonably foreseeable impacts of the leases, before leasing occurs.² BLM’s dismissal of Alternative 5 turns

² See, e.g., N.M. ex rel. Richardson v. BLM, 565 F.3d 683, 718 (10th Cir. 2009) (NEPA analysis of all “reasonably foreseeable impacts must occur . . . before an ‘irretrievable commitment of resources’ is made,” such as issuance of a lease); Custer Cty. Action Ass’n v. Garvey, 256 F.3d 1024, 1040 (10th Cir. 2001) (no-action alternative serves as a benchmark to measure the potential impacts of the proposed action).

that analysis on its head, and improperly allows the existence of these void leases to drive its new decision.

Alternative 5 is the right choice for other reasons as well. As noted by the more than 50,500 public comments on the DEIS that called for cancelling all 65 leases, FEIS at E-4 to E-5 (Table E-4), the area covered by those leases has exceptional natural values that are not compatible with oil and gas development. In addition to tens of thousands of roadless acres, the leases cover the East Willow Area, the Lower Battlement Research Natural Area, Mamm Peak and important habitat for a variety of species and plants. See DEIS Comments at 24–41. Given the value of these lands, BLM should acknowledge that the leases were void ab initio, cancel them, and start with a clean slate.

Doing so will have a negligible impact on regional oil and gas production because fewer than ten percent of the leases (only 5 out of 65) are currently producing. FEIS at 1-5 to 1-6 (Table 1-1). The lack of production is particularly striking given that the large majority of the leases (57) are already past their ten-year lease term, and seven are due to expire by the end of 2017. Id. Dozens of the leases, in fact, should already have expired but for suspensions of operation and production granted by BLM as part of this NEPA process. See DEIS Comments at 14–15.³ Clearly, the companies holding these improperly-issued leases are in no hurry to bring them into production.

The FEIS confirms how small the impact of cancelling the leases will be. The Socio-economics section predicts that cancelling all the leases will reduce annual natural gas production in the four-county region (Garfield, Mesa, Rio Blanco and Pitkin Counties) by only about two percent.⁴ This minimal impact on production is far outweighed by the longer-term benefit of preserving these lands for future generations.

The FEIS also overstates the logistical difficulty of voiding all 65 leases. For example, it states that “all producing wells would have to be plugged and abandoned, infrastructure would be removed, roads, well pads, and other ancillary facilities would be reclaimed, and all disturbed areas would be revegetated.” FEIS at 2-64. These tasks, however, will not be required for 90% of the leases at issue. As noted, only five of the 65 leases are held by production. FEIS at 1-5 to 1-6 (Table 1-1) (leases COC 61121, COC 66724, COC 66918, COC 66920, COC 67544 held by

³ Several of the leases addressed in the FEIS have expired but are still subject to administrative appeal. See FEIS at 1-13, 2-88 to 2-89. These leases should be cancelled to ensure that they are terminated regardless of the outcome of any appeals.

⁴ The FEIS estimates about a 20 Bcf per year difference in production between Alternatives 1 and 5. FEIS at 4.17-13 (Table 4.17-3). By comparison, Colorado Oil and Gas Conservation Commission (COGCC) records indicate that approximately 852 Bcf of natural gas was produced in 2012 in the same four counties. See COGCC, Monthly Coalbed and Natural Gas Produced by County, <http://cogcc.state.co.us/COGCCReports/production.aspx?id=MonthlyGasProdByCounty> (last visited Aug. 29, 2016).

production).⁵ Many of those well pads, moreover, are located outside the lease boundaries and are being used to access other minerals, meaning the pad and other infrastructure can still be used even if the federal lease is cancelled. See FEIS at 2-67 (Figure 2-14).

III. THE PREFERRED ALTERNATIVE IS CONTRARY TO LAW BECAUSE IT REAFFIRMS LEASES WITHOUT REQUIRING COMPLIANCE WITH THE FOREST SERVICE ROADLESS RULE AND OTHER LAWS.

The Preferred Alternative is also arbitrary and capricious and contrary to law because it reaffirms most of the 40 non-cancelled leases in violation of the Forest Service Roadless Rule, and without conforming with the Forest Plan.

A. Roadless Rule

The Preferred Alternative is contrary to law because for the leases subject to Alternative 2, it fails to require compliance with the Forest Service Roadless Rule. While these leases were erroneously issued without roadless stipulations, the Roadless Rule is an applicable legal requirement for them. See DEIS Comments at 42–45. The Preferred Alternative inexplicably repeats the same mistake BLM made when it issued these leases during the last administration.

Under FOOGLRA, BLM cannot offer national forest lands for lease without obtaining the Forest Service's consent. 30 U.S.C. § 226(h); 43 C.F.R. § 3101.7-1(c). To obtain that consent, BLM must provide the Forest Service with a description of the specific lands proposed for leasing. 43 C.F.R. § 3101.7-1(b), (c); BLM Handbook H-3101-1 at 27 & Appx. 3 at 3; BLM Handbook H-3120-1 at 10. Upon receiving that description, the Forest Service confirms that the lands are available for leasing under the Forest Plan and that there is no new information that requires additional environmental analysis prior to leasing. 36 C.F.R. § 228.102(e). In addition, the Forest Service must ensure that the proposed leases comply with all applicable laws. 55 Fed. Reg. 10,423, 10,430 (Mar. 21, 1990). For example, the Forest Service cannot consent to issuance of leases that would violate NEPA or the Roadless Rule. The Forest Service also must confirm that lease terms comply with requirements in the governing Forest Plan, and that any necessary conditions and stipulations are attached to the leases. See 36 C.F.R. § 228.102(c), (e).

As part of meeting these requirements, the Forest Service informs BLM of stipulations or conditions that should be imposed on leases. Id. § 228.102(e)(2). Any leases issued by BLM must include stipulations or other conditions required by the Forest Service as part of the consent process. 43 C.F.R. § 3101.7-2(a).

Leases on national forest lands are subject to cancellation where the FOOGLRA consent process has not been followed. Grynberg, 2008 WL 2445564 at *3–*5 (leases subject to

⁵ In addition, Leases COC 58836 and 58839, in the Willow Creek area of Zone 3, each have a well that was deemed capable of production but which has been shut in for more than a decade and never produced any oil or gas. FEIS at 1-6 (Table 1-1); infra pp. 21-23.

cancellation for failure to get Forest Service consent); Liberty S. Partners, 183 IBLA 383, 384–86 (2013) (upholding lease cancellation where error occurred due to miscommunication between Forest Service and BLM); Letters from Nancy McCarty, BLM, to SG Interests VII, Ltd., re: Lease Amendments and Refunds for COC 66687, COC 66689, COC 66690, COC 66693 (Jan. 20, 2010) (DEIS Comments Appx. 1004–1012) (cancelling parts of leases that were improperly issued on Forest Service lands unavailable for leasing at Sunlight Ski Area); see also High Plains Petroleum Corp., 125 IBLA 24, 26–27 (1992) (leases subject to cancellation when issued in violation of applicable Resource Management Plan).

That is what happened here. Numerous leases were erroneously issued without attaching stipulations requiring compliance with the Forest Service’s 2001 Roadless Rule. The FEIS states that 54 of the 65 leases, and most of the total acreage in the four zones, lie within Colorado Roadless Areas. FEIS at 3.12-5 to 3.12-6. But while almost all of those roadless leases were issued after adoption of the Forest Service’s Roadless Rule, they generally lack stipulations or lease notices requiring compliance with that rule. See FEIS at 3.12-3 (Figure 3.12-1) (map showing leases and roadless areas); id. at 1-5 to 1-7, 2-2 to 2-6 (Tables 1-1 and 2-1 listing leases and stipulations).⁶

The Forest Service has acknowledged that during much of the relevant time period, it assumed (incorrectly) the 2001 Roadless Rule did not apply because it was embroiled in litigation. The Forest Service’s 2015 Oil and Gas Leasing EIS (OGLEIS) explains that for several years beginning in 2001, different court opinions “left the Forest Service with varying interpretations as to what rules and direction is to be applied with regard to Roadless. During this time the WRNF relied on Forest Plan direction.” OGLEIS at 346 (DEIS Comments Appx. 353).

Unfortunately, the existing “Forest Plan direction” did not account for the Roadless Rule. At that time, the White River National Forest was operating under a 1993 oil and gas leasing EIS, which had been issued eight years before promulgation of the 2001 Roadless Rule. Further, when the Forest Service incorporated its 1993 oil and gas leasing decision in a 2002 forest plan revision, the agency assumed (incorrectly) that the Roadless Rule did not apply. U.S. Forest Serv., Record of Decision for the Land and Resource Management Plan – 2002 Revision, White River National Forest (2002) 9–10, 37 (DEIS Comments Appx. 681–82, 709) (2002 forest plan ROD treats the 2001 Roadless Rule as enjoined and allows significant road building in inventoried roadless areas).

The Forest Service’s disregard of the Roadless Rule was an error. Most of the leases missing roadless stipulations were sold during a period in late 2002 and 2003 (Dec. 12, 2002–July 14, 2003) when the Roadless Rule was not enjoined by any court order and was indisputably

⁶ A handful of leases issued in 2007 and later (COC 70014, COC 70015, COC 75070, COC 76123) do have roadless stipulations. FEIS at 1-6 (Table 1-1), 2-4 (Table 2-1). In addition, two leases sold before 2001 (COC 58677, COC 59630) have no surface occupancy (NSO) stipulations protecting roadless areas. Id. at 1-5 (Table 1-1), 2-2 (Table 2-1).

in effect. See FEIS at 1-5 to 1-7 (Table 1.1) (listing lease dates); see also Kootenai Tribe of Idaho v. Veneman, 313 F.3d 1094 (9th Cir. 2002) (Ninth Circuit on December 12, 2002 reversed preliminary injunction that had been issued by Idaho district court); Wyoming v. U.S. Dep't of Agric., 414 F.3d 1207, 1211 (10th Cir. 2005) (Wyoming I) (noting that Roadless Rule was enjoined by Wyoming district court on July 14, 2003). The failure to attach stipulations or lease notices to these leases was plainly a mistake.

Moreover, while some leases were issued during periods when the Roadless Rule was subject to an injunction, that injunction was subsequently vacated as moot. Wyoming I, 414 F.3d at 1214. It therefore is a nullity that has no "legal consequences." Rio Grande Silvery Minnow v. Bureau of Reclamation, 601 F.3d 1096, 1132 (10th Cir. 2010) (quoting United States v. Munsingwear, Inc., 340 U.S. 36, 41 (1950)).⁷ Moreover, the Roadless Rule was eventually upheld by the Tenth Circuit and is the law today. Wyoming v. U.S. Dep't of Agric., 661 F.3d 1209, 1220 (10th Cir. 2011) (Wyoming II).

For all these leases, the failure to require lease notices or stipulations addressing Roadless Rule compliance was improper. For example, Forest Service regulations mandate that all "appropriate stipulations . . . necessary to implement" the forest plan, and to comply with other laws, must be included in the lease. 55 Fed. Reg. at 10,430; see also 36 C.F.R. § 228.102(e). BLM also noted in the preamble to its operating regulations that "all other applicable laws must be complied with and are generally cited as stipulations to the lease." 47 Fed. Reg. 47,758, 47,759 (Oct. 27, 1982) (emphasis added).

A notice or stipulation expressly referencing the Roadless Rule is necessary because it ensures that the rule will be implemented when the lessee proposes development on the lease. BLM and the Forest Service routinely attach lease stipulations or notices where certain areas of a lease are subject to requirements for protection of specific natural resources such as wetlands, big game winter range, landslide-prone areas, steep slopes, areas of critical environmental concern, and habitat for endangered or threatened species. See, e.g., BLM, Offer to Lease and Lease for Oil and Gas No. COC65523 (Mar. 1, 2002) (Lease 65523) (DEIS Comments Appx. 722–733). Roadless areas are no different. A lease notice or stipulation expressly referencing the Roadless Rule is necessary to ensure that its requirements are not overlooked during the development phase.

BLM and the Forest Service have themselves recognized this necessity. A handful of the leases addressed in the FEIS (which were issued in 2007) have Roadless Rule stipulations because BLM added them in response to a protest filed by Wilderness Workshop and other groups. See FEIS at 1-6 (Table 1-1) (listing issuance dates of leases), 2-4 (Table 2-1) (table of stipulations); Letter from Lynn E. Rust, BLM, to Keith Bauerle, Earthjustice re: Decision on

⁷ The United States, in fact, supported dismissal of the injunction appeal and argued to the Tenth Circuit that it was moot. See Wyoming I, 414 F.3d at 1211 n.4. The government cannot now reverse course and assert that the vacated injunction continues to have legal consequences controlling management of these leases today.

Protest of Aug. 10, 2006 Competitive Oil & Gas Lease Sale Protest (May 25, 2007) (Protest Letter) (DEIS Comments Appx. 735–36). While the Roadless Rule litigation remained pending at the time the leases were issued, the agency did not deny stipulations were necessary. Instead, BLM attached stipulations that provided for compliance with the rule.⁸ Similarly, when issuing leases elsewhere in Colorado, BLM attached a lease notice regarding the Roadless Rule. See, e.g., Lease 65523 (DEIS Comments Appx. 731); BLM, Offer to Lease and Lease for Oil and Gas No. COC63886 (Sept. 1, 2000) (Lease 63886) (DEIS Comments Appx. 755). A similar approach has been taken with numerous other roadless leases. See Decl. of Ava C. Farouche Attachment 1.

BLM cannot repeat the error it made in issuing these leases: it must ensure that the Forest Service’s Roadless Rule is applied to any leases it does not cancel. Regardless of the previous errors, the Roadless Rule was an existing legal requirement that applies to them and limits any rights under those leases.⁹ BLM’s decision must comply with the Rule.

The Preferred Alternative does not satisfy this requirement: for numerous leases, it fails to add any stipulations or lease notices for roadless areas expressly requiring compliance with the 2001 Roadless Rule. As a result, the Preferred Alternative is not “in accordance with law.” 5 U.S.C. § 706(2). It also fails to comply with FLPMA and BLM’s resource management plan for the Colorado River Valley Field Office. See, e.g., 43 U.S.C. § 1732(b) (requiring BLM to comply with FLPMA “and other applicable law,” and to subject leases and other management to “such terms and conditions as are consistent with such law”); BLM, Colo. River Valley Field

⁸ In fact, on one lease (COC 70013) BLM appears to have neglected to add a roadless stipulation for White River National Forest lands, even following the successful protest. Compare Protest Decision (DEIS Comments Appx. 735–36) and BLM, Colorado Oil and Gas Lease Sale Instructions for Use of CSU Stipulation (Aug. 2006) (DEIS Comments Appx. 756) and FEIS at 2-3 to 2-4 (Table 2-1) (roadless stipulations only for portion of lease on Grand Mesa-Uncompaghe National Forest, but not portion on White River National Forest) with FEIS at 2-32 (adding additional 1,200 acres of roadless stipulation under Alternative 3). This provides further evidence that the lease was improperly issued and is subject to cancellation. 43 C.F.R. § 3108.3(d).

⁹ Some lessees’ DEIS comments assert that their leases are not subject to the 2012 Colorado Roadless Rule (the Colorado Rule). This argument is misplaced because the leases are subject to both the 2001 Roadless Rule, and the 2012 Colorado Rule. The 2012 Colorado Rule “preserves any existing limitations on surface development rights arising from lease terms, lease stipulations” and other documents. 36 C.F.R. § 294.46(b). Moreover, the Colorado Rule requires protections similar to those in the nationwide 2001 Rule. See 36 C.F.R. §§ 294.40 to 294.49. Because the 2012 Colorado Rule is “not inconsistent with” the rights granted in leases that were already limited by the 2001 Rule, the lessees must comply with the 2012 Colorado Rule as well. See BLM Lease Form 3100-11; Forest Service Manual 2822.42 (standard stipulation requiring compliance will all Forest Service rules unless inconsistent with rights granted by BLM in lease).

Office Proposed Resource Management Plan and Final Environmental Impact Statement (RMP) at 2-24 (Feb. 2014) (stating that management under all RMP alternatives considered will “[c]omply with state and federal laws, regulations, policies, and standards . . .”); BLM, Colo. River Valley Field Office, Record of Decision and Approved Resource Management Plan (ROD) at 15 (June 2015) (“In addition to FLPMA and NEPA (and their associated regulations), the BLM must comply with the mandate and intent of all applicable laws, regulations, guidelines, and policies that apply to BLM-administered lands and Federal mineral estate.”).¹⁰ Because the Preferred Alternative is inconsistent with the Roadless Rule, it also fails to comply with FLPMA’s requirement to prevent unnecessary or undue degradation of the public lands. 43 U.S.C. § 1732(b).

Moreover, BLM’s treatment of the Roadless Rule fails to comply with NEPA and is arbitrary and capricious. Council on Environmental Quality regulations require that BLM explain how the “alternatives considered in [the EIS] and decisions based on it will or will not achieve the requirements of [NEPA] and other environmental laws and policies.” 40 C.F.R. § 1502.2(d); see also *id.* § 1502.16(c) (EIS must discuss conflicts between action and federal land use plans, policies and controls). The FEIS states that the 2012 Colorado Roadless Rule’s “applicability is still legally unresolved.” FEIS at 3.12-2, and the DEIS states “[a]pplication of the 2001 Roadless Rule . . . is unsettled.” DEIS at 4.12-2. Rather than addressing how the Roadless Rules apply to its decision, however, BLM leaves the issue to the Forest Service. See FEIS at 3.12-2 (stating that “[c]ompliance [with the Colorado Rule] is the responsibility of the Forest Service”). This approach fails to explain how compliance with the 2001 Roadless Rule, and the Colorado Rule, will be achieved under the Preferred Alternative. BLM’s assertion that this is simply the Forest Service’s responsibility does not satisfy NEPA.

B. White River National Forest Plan

In its current Forest Plan, the Forest Service has determined what lease stipulations are necessary and appropriate for oil and gas development. By dropping protections for 27 leases that were included in the DEIS proposed action (Alternative 4), the Preferred Alternative is inconsistent with the Forest Plan and contrary to several laws.

FLPMA requires that BLM coordinate its management “with the land use planning and management programs of other Federal departments and agencies” so long as doing so is “consistent with the laws governing the administration of public lands.” 43 U.S.C. § 1712(c)(9). Similarly, the 2005 Energy Policy Act requires BLM and the Forest Service to “ensure that . . . lease stipulations are coordinated between agencies.” 42 U.S.C. § 15922(b)(3)(B); see also Memorandum of Understanding (MOU) Between U.S. Dep’t of Interior Bureau of Land Management and U.S. Dep’t of Agric. Forest Serv. Concerning Oil and Gas Leasing and

¹⁰ Available at http://www.blm.gov/co/st/en/BLM_Programs/land_use_planning/rmp/kfo-gsfo/colorado_river_valley.html (Proposed RMP and Final EIS); http://www.blm.gov/style/medialib/blm/co/field_offices/crvfo/crvfo_rod.Par.56443.File.dat/01%20CRVFO_ROD_ARMP_FINAL_6-12-15.pdf (ROD).

Operations (BLM MOU WO300-2006-07) at 1–2 (Apr. 14, 2006) (MOU implementing Energy Policy Act). And Section 101(b) of NEPA imposes a “continuing responsibility” on federal agencies “to use all practicable means . . . [to] coordinate Federal plans, functions, programs, and resources” to protect the environment and preserve natural resources. 42 U.S.C. § 4331(b). The Preferred Alternative fails to comply with these requirements.

Moreover, in the OGLEIS, the Forest Service determined (pursuant to the 2005 Energy Policy Act) that the requirements and restrictions being imposed on oil and gas leasing were the minimum limits necessary for protection of the resources in question. OGLEIS at 27 (DEIS Comments Appx. 34). BLM is relying on that same OGLEIS in its own analysis: “BLM has incorporated as much of the Forest Service’s new NEPA analysis . . . as possible into this analysis.” FEIS at 1-1. Given that reliance, selecting the Preferred Alternative would be arbitrary and capricious because it disregards the Forest Service’s conclusions and reaffirms the leases with terms that the Forest Service has determined are inadequate to protect the resources of this area. Such a decision also would violate FLPMA’s requirement to prevent “unnecessary or undue degradation” of these lands. 43 U.S.C. § 1732(b).

Further, BLM regulations require that in issuing leases on lands where the surface is managed by a different agency, BLM “shall accept all reasonable recommendations of the surface managing agency.” 43 C.F.R. § 3101.7-2(c). Here, the surface managing agency (the Forest Service) has determined in its OGLEIS what the necessary requirements are for protection of roadless lands and other Forest resources. Based on that analysis, the agency recommended closing part of the White River National Forest to leasing, imposing NSO stipulations on roadless areas, and adding many other stipulations. The Forest Service’s recommendations are entirely reasonable. BLM’s FEIS, in fact, recognizes that these recommendations (contained in Alternative 4) are reasonable. See FEIS at 2-1 (explaining that DEIS analyzes “reasonable” alternatives), 2-63 (analyzing Alternative 4). As such, they must be accepted by BLM.

C. FOOGLRA

Obtaining valid Forest Service consent under FOOGLRA provides a mechanism to ensure compliance with the Roadless Rule and the Forest Plan, as well as other legal requirements. But because of the errors made when the leases were issued, supra pp. 6-9, there has never been valid Forest Service consent to lease these lands. BLM cannot rely on the existing consent, which is outdated and legally invalid, to issue a new decision ratifying these leases. Instead, it must obtain updated and valid consent from the Forest Service for leases that are not cancelled.

Getting legally sufficient FOOGLRA consent is especially important because the Preferred Alternative departs substantially from the management decisions in the Forest Service’s 2015 OGLEIS and ROD. In addition to ensuring that leases comply with the law, the FOOGLRA consent process requires a Forest Service determination of whether significant new information requires additional environmental analysis. 36 C.F.R. § 228.102(e)(1). If such new information exists, or the existing NEPA analysis is inadequate, new analysis is required before

the Forest Service consents to leasing. Id. The Forest Service may conclude that BLM departures from the OGLEIS justify additional site-specific analysis of certain issues before decisions are made to reaffirm, modify or cancel particular leases.

BLM and the Forest Service both acknowledge that the NEPA analysis under which the leases were initially issued—the 1993 Oil and Gas Leasing EIS for the White River National Forest—is totally outdated and inadequate to support decisions on the 65 leases. BLM, in fact, seeks to rely substantially on the new Forest Service OGLEIS rather than the 1993 version. 79 Fed. Reg. at 18,577; FEIS at 1-1, E-27. Given the consensus that significant new information exists and that the 1993 EIS does not adequately address current conditions, it would be arbitrary and capricious for BLM to rely on a flawed Forest Service consent that was based on that same 1993 EIS.

FOOGLRA, moreover, requires more than just ensuring compliance with applicable laws and considering new information. FOOGLRA also requires BLM to abide by the Forest Service’s choices about whether lands may be leased and under what conditions. Even if leasing in certain roadless areas is allowed under the 1993 EIS or the 2015 OGLEIS, it is not required. The Forest Service may determine based on the new information available today that leasing specific roadless or other lands is not “appropriate” despite being permitted under the Forest Plan. 55 Fed. Reg. at 10,430 (a finding that leasing is consistent with forest plan “is more narrow than the decision as to whether or not the Forest Service will authorize the Bureau of Land Management to offer the specified lands for leasing”).

In short, BLM’s Preferred Alternative is arbitrary and capricious and contrary to law because it fails to comply with the Roadless Rule, FLPMA, NEPA, FOOGLRA and other laws.

IV. THE PREFERRED ALTERNATIVE’S REAFFIRMATION OF 27 UNITIZED LEASES IS ARBITRARY AND CAPRICIOUS.

The Preferred Alternative would reaffirm the 27 leases with virtually no change on the basis that they are “held by production.”¹¹ According to the FEIS, “modification or cancellation of these leases would result in considerable adverse economic impacts and technical challenges,” including “loss of future production,” and costs associated with plugging, abandoning and reclaiming wells. FEIS at 2-88.

This decision would be arbitrary and capricious because in reality, at least 20 of the 27 leases are not producing and have never actually been drilled. Compare FEIS at 1-5 to 1-6 (Table 1-1) with id. at 2-70 to 2-71 (Table 2-5); see also supra n. 5. As a result, cancelling these leases (if the lessee refused to accept new stipulations required under Alternative 4) would not require removing any equipment or infrastructure. Nor would requiring Alternative 4 stipulations adversely affect future oil and gas production: BLM’s FEIS predicts that in Zones 1,

¹¹ A timing limitation would be added to five acres on one of the 27 leases. FEIS at 2-70 (Table 2-5).

2 and 4, future production will be the same under Alternative 4 and the Preferred Alternative. FEIS at 2-104 to 2-105.

For the 27 leases, FEIS Alternative 4 is well within BLM's authority to implement. BLM also has ample authority to cancel these leases, either administratively or through a court order. DEIS Comments at 17-19.¹²

The Preferred Alternative is also arbitrary and capricious as applied to specific unitized leases. In particular, 21 of the 27 reaffirmed leases are (or were) committed to four units: Encana's Middleton Creek, Orchard, and Place Mesa units, and WillSource's Willow Creek unit. The Preferred Alternative is arbitrary and capricious for these leases because these leases already have been, should already have been, or soon will be, eliminated from the units. BLM's plan to reaffirm these leases based on their unitized status, while eliminating them from those units, is circular and the very definition of arbitrary and capricious.

A. Legal Framework for Eliminating Leases from Units.

Unitization is supposed to be "a conservation measure which benefits both lessor and lessee and tends to prevent waste of a natural resource." Phillips Petroleum Co. v. Peterson, 218 F.2d 926, 933 (10th Cir. 1954). To ensure that unitization serves these public purposes, operators must meet strict deadlines to demonstrate diligent development. See, e.g., Woods Petroleum Corp. v. Dep't of Interior, 47 F.3d 1032, 1035 (10th Cir. 1995) (en banc) (unit agreements can extend leases "beyond the[ir] primary term" only so "long as there is production in paying quantities"); accord Trans-W. Petroleum, Inc. v. U.S. Gypsum Co., 584 F.3d 988, 994 (10th Cir. 2009) (leases outside participating area that were not allocated share of production expire at the end of their primary term). "[T]he purpose of unitization is not to extend leases[.]" Aera Energy LLC v. Salazar, 642 F.3d 212, 217 (D.C. Cir. 2011) (quoting Samedan Oil Corp., 173 IBLA 23, 37 (Nov. 14, 2007)). If the operator misses deadlines, the leases will be terminated from a unit. See 43 C.F.R. §§ 3105-2.3(c), 3186.1 ¶ 2(e) (model unit agreement).

BLM's Unitization (Exploratory) H-3180-1 Manual Handbook (1992) sets the deadlines and procedures incorporated into most unit agreements. See generally Thomas F. Reese & William Reese, Time Frames & Operational Obligations, at 4-1, in Federal Onshore Oil & Gas Pooling and Unitization, 2014 Rocky Mtn. Mineral L. Found. Inst. Paper No. 4 (Oct. 29, 2014).

After a unit is approved, operators must commence drilling an "adequate test well" (sometimes called a unit obligation well) within six months. Id.; see also BLM Manual H-3180-

¹² Moreover, leases committed to a unit agreement that have no producing wells can be cancelled administratively without requiring judicial action. Any question about whether a court order is required to cancel unitized leases can be addressed by contracting the unit to exclude the lease being cancelled. 43 C.F.R. § 3186.1 ¶ 2 (unit area can be contracted "when requested by [BLM]," which shall occur "whenever such . . . contraction is deemed to be necessary or advisable").

1 at § II(E); BLM Draft Manual Section 3180 – Unitization at 1-17 (1992) (defining “obligation well”). Operators must continue to drill one well every six months until a well “capable of producing unitized substances in paying quantities is completed.” Reese & Reese, 2014 RMMLF at 4-1; see also 30 U.S.C. § 226(m) (unitized leases shall continue so long as the unit’s “production is had in paying quantities”); 43 C.F.R. §§ 3107.3-1 (same), 3160.0-5 (defining “paying well” and “[p]roduction in paying quantities”). Unlike the distinct but related test for whether a well has sufficient production for holding a lease, a well is “capable of producing unitized substances in paying quantities” for the purposes of holding a unit agreement only if it can produce sufficient hydrocarbons to cover the costs of operations, marketing the product, and drilling and completing the well. See Yates Petroleum Corp., 67 IBLA 246, 256–58 (Sept. 24, 1982). Units automatically terminate if production in paying quantities is not established within five years of their effective date. Manual H-3180-1 at § II(N)(1).

After BLM makes a paying well determination, operators must propose a “participating area” encompassing the formation reasonably proven to be productive of unitized substances in paying quantities. Reese & Reese, 2014 RMMLF at 4-13. All leases outside the participating area are automatically terminated from the unit five years after the participating area’s effective date, unless the operator is in the process of drilling a well in the area that would otherwise contract on the five-year anniversary date. Id. at 4-13 to 4-14.¹³ In such a case, the areas outside the participating area will continue for up to another five years, but only if the operator completes a new well every 90 days outside the participating area. Id. at 4-14; see also 43 C.F.R. § 3161.1 ¶ 2(e) (model unit agreement). Under some conditions, operators may obtain a one-time two-year extension of the second five-year term, during which new wells must be drilled every 90 days. Reese & Reese, 2014 RMMLF at 4-15. No further extensions are available beyond this 12-year period after the participating area’s effective date. Id. at 4-16.

BLM’s regulations incorporate strict deadlines to further Congress’s purpose of allowing unitization only for diligent operators. See 30 U.S.C. § 226(m). But BLM allows suspensions of some unit obligations due to “unavoidable delay.” Manual H-3180-1 at § II(J). Delay is “unavoidable” only if BLM itself or forces beyond the operator’s control make compliance impossible. Id. Such suspensions “apply only to unit requirements and will not serve to extend leases that otherwise would expire.” Id. at § II(J)(1).

¹³ The unit operator must annual submit a Plan of Development detailing operating plans for the upcoming year and a Summary of Operations describing what actually occurred the prior year. Manual H-3180-1 at §§ II(H)(2)–(3).

B. The Leases Have Been, Should Already Have Been, or Will Soon Be Eliminated from the Units.

1. Orchard Unit

The Orchard Unit includes seven leases at issue in this NEPA process: COC 58677, 59630, 66727, 66728, 66729, 66730, and 66731. FEIS at 1-5.¹⁴ BLM approved Encana's Orchard Unit on November 14, 2002 and assigned it number COC66496X. Letter from Judith K. Armstrong, BLM, to Encana Oil & Gas (USA) Inc. (Nov. 14, 2002). The only evidence that Encana attempted to comply with its obligation to drill a test well within six months is a March 24, 2003 letter requesting BLM's approval to drill the obligation well. Letter from Dorothy Dejmaj, Encana, to Richard J. Ryan, BLM (Mar. 24, 2003). Over a year later, Encana requested a determination that the Orchard 16-12 Unit Well was capable of production in paying quantities. Letter from Constance D. Heath, Encana, to Richard J. Ryan, BLM (June 8, 2004). On July 28, 2004, BLM granted the request effective March 18, 2004. Letter from Richard J. Ryan, BLM, to Constance D. Heath, Encana (July 28, 2004).

In 2007, BLM approved and revised the unit's Initial Participating Area, COC66496A, also effective March 18, 2004. Dorothy Dejmaj, Encana, Orchard Unit 2007 Review of Operations and 2008 Plan of Development at 2 (Feb. 20, 2008). Neither the Initial nor First Revised Participating Area includes any of the leases at issue in this NEPA process. Compare Encana, Map of Orchard Unit (Feb. 18, 2009) (showing location of Participating Areas) with FEIS at 2-13 (showing location of leases at issue in this NEPA process); see also Farouche Decl. Attachment 3.

The leases at issue in this NEPA analysis therefore should have terminated from the unit no later than March 18, 2009, five years after the effective date of the Initial Participating Area. Reese & Reese, 2014 RMMLF at 4-13 to 4-14; accord 43 C.F.R. § 3186.1 ¶ 2(e) (model unit agreement).¹⁵ With this deadline looming, but no wells drilled outside the Participating Area, Encana in late 2008 requested a three-year extension of the unit contraction date, blaming everything from the weather to peripherally related permitting delays. Letter from Georgia G. Kofoed, Encana, to Richard J. Ryan, BLM (Dec. 30, 2008). On March 19, 2009, BLM granted Encana a more limited six-month suspension, extending the termination date to September 17, 2009. See Letter from Georgia G. Kofoed, Encana, to Richard J. Ryan, BLM (Mar. 30, 2009).

¹⁴ Initially, the unit included only leases COC 58677 and 59630. Letter from Judith K. Armstrong, BLM, to Encana Oil & Gas (USA) Inc. (Nov. 14, 2002). These leases were issued in 1995 and 1996, respectively. FEIS at 1-5. Leases COC 66727, 66728, 66729, 66730, and 66731 were joined to the Unit in August 2003 after being issued in the May 2003 lease sale. Letter from Judith K. Armstrong, BLM, to Encana Oil & Gas (USA) Inc. (Aug. 29, 2003).

¹⁵ None of the subsequently approved Participating Areas (COC66496B, C, and D) overlap with any of the leases at issue in this NEPA process. See Farouche Decl. Attachment 3; see also BLM, Approval and Subsequent Renaming of Non-Initial Orchard Unit Participating Areas (2009–2012).

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Encana then requested a further extension through December 1, 2009. Id. BLM granted the extension, but cautioned that all leases outside the Participating Area would terminate if Encana did not drill a new well every 90 days. Letter from Sherri Thompson, BLM, to Georgia G. Kofoed, Encana (Mar. 30, 2009).

Undeterred, Encana requested yet another two-year extension in October 2009, which BLM denied. Letter from Pat Gallagher, BLM, to Georgia Kofoed, Encana (undated). Finally forced to comply with its obligations, Encana was actively drilling a well on December 1, 2009, thereby triggering the start of the second five-year period after the paying well determination, also known as the “continuous drilling phase.” Letter from Jerome D. Strahan, BLM, to Georgia Kofoed, Encana (Mar. 31, 2010).¹⁶

Encana quickly returned to its modus operandi of requesting exceptions. BLM granted the company’s request to drill just two wells a year, instead of the requisite one well every 90 days, until December 1, 2014, when the second five-year term was slated to end. Id. It is unclear if Encana complied with even with this relaxed requirement. Encana did not submit a compliance report in 2010. It submitted a compliance report showing that it drilled the requisite two wells in 2011, and asking permission to use extra wells drilled in 2011 towards its 2012 obligation. Letter from Georgia Kofoed, Encana, to Roger Hall, BLM (Sept. 23, 2011). BLM apparently granted this request. See id. at 2 (stamp with “Approved by /s/ Roger Hall 4/24/2012”).

Since 2011, Encana has drilled no wells on the Orchard Unit. See Jessica Sellyei, Encana, Orchard Unit 2011 Review of Operations and 2012 Plans of Development at 5 (Mar. 1, 2012) (noting that 13 new wells were drilled on the Orchard Unit in 2011); P.M. Di Grappa, Encana, Orchard Unit 2012 Review of Operations and 2013 Plans of Development at 1 (Mar. 1, 2013) (“No wells were drilled in 2012.”); Richard A. Champion, Encana, Orchard Unit 2013 Review of Operations and 2014 Plans of Development at 1 (Feb. 28, 2014) (“Encana drilled and/or completed the following wells during 2013: None[.]”).¹⁷

In January 2013, Encana requested a one-year suspension of its unit obligations, stating that it was having access difficulties. Letter from P.M. Di Grappa, Encana, to Roger Hall, BLM (Jan. 11, 2013). BLM granted the request, suspending drilling obligations through December 1, 2013. Letter from Jerome D. Strahan, BLM, to P.M. Di Grappa, Encana (Feb. 13, 2013).

¹⁶ That well, Satterfield Federal 10-3H, is not located within any of the leases at issue in this NEPA process. See Danielle Scott, Encana, Orchard Unit Area 2010 Review of Operations and 2011 Plans of Development at Ex. A (Mar. 1, 2011); see also Farouche Decl. Attachment 3.

¹⁷ As of August 26, 2016, there was no evidence in the Orchard Unit file of Encana drilling any wells since 2011. Although Encana has periodically obtained Applications for Permits to Drill (APDs) for Orchard Unit wells since then, it has allowed all of them to expire without drilling a well.

The following year, Encana requested another suspension, based on a new rationale: it cited this NEPA process as grounds for the suspension. The company's excuse was pretextual: at the time it made the request, Encana already had indefinitely suspended all new drilling operations in the Piceance Basin due to low market prices for natural gas.¹⁸ Its plans have not changed since then.¹⁹ Nevertheless, BLM granted an indefinite suspension effective February 1, 2014. Letter from Jerome D. Strahan, BLM, to Julia Branson, Encana (Mar. 11, 2014).²⁰ The IBLA has already rejected a suspension under analogous circumstances. River Gas Corp., 149 IBLA 239, 246 (June 21, 1999) (“[I]t cannot rationally be argued that Unit operations have been suspended during the preparation of an EIS” addressing Federal leases, where development could continue on non-federal parts of the unit).

Throughout the Orchard Unit's 14-year history, Encana has consistently missed deadlines only to be granted extension after extension. And Encana has never drilled any wells on the leases at issue in this NEPA process, or demonstrated the intent or ability to do so.

Under BLM's procedures and regulations, the leases at issue should have been eliminated from the unit no later than March 18, 2014, ten years after the paying well determination's effective date. BLM's serial extensions of unit deadlines are contrary to law and arbitrary and capricious.

Even with the pre-2014 suspensions BLM granted Encana, the leases should have been eliminated from the unit by December 1, 2015. But instead of requiring Encana to face the consequences of its decision to stop drilling new wells in the Piceance Basin, BLM used this NEPA process to further suspend Encana's obligations. That 2014 suspension was inconsistent with the Mineral Leasing Act and BLM regulations and procedures: Encana's failure to bring those leases into production had nothing to do with the current NEPA process. Rather, it resulted

¹⁸ See, e.g., Dennis Webb, Encana Suspends Drilling in Basin, Grand Junction Daily Sentinel (Dec. 14, 2013), available at <http://www.gjsentinel.com/news/articles/encana-suspends-drilling-8232in-basin>; John Stroud, No New Piceance Wells for Encana in 2014, Glenwood Springs Post-Independent (Dec. 14, 2013), available at <http://www.postindependent.com/news/local/no-new-piceance-wells-for-encana-in-2014/>.

¹⁹ See Encana, Annual Information Form 16 (Feb. 29, 2016), available at <https://www.encana.com/pdf/investors/financial/annual-reports/2015/annual-information-form-2015.pdf> (mentioning no wells drilled in 2015 and stating that “[s]ince December 2013, Encana . . . agreed to postpone the drilling of natural gas wells” in the Piceance Basin due to low gas prices); Encana, Annual Information Form 16 (Mar. 3, 2015), available at <https://www.encana.com/pdf/investors/financial/annual-reports/2015/annual-info-form.pdf> (noting 1 Piceance Basin Well drilled in 2014).

²⁰ Encana later submitted another request for the indefinite suspension of the second five-year term, which BLM also granted, effective February 1, 2014. See Letter from Julia L. Branson, Encana, to Jerome Strahan, BLM (May 29, 2014); Letter from Jerome D. Strahan, BLM, to Julia L. Branson, Encana (June 9, 2014).

from the company's own business decisions to delay drilling because of market conditions and terrain.

BLM cannot compound these prior errors by using the unitized status of these leases—which should already have terminated—to justify reaffirming them without adequate stipulations. The purpose of the 2014 suspension was to accommodate BLM's review process, not to drive the outcome of that review. The Preferred Alternative turns this analysis on its head: leases that would have been terminated from the Orchard Unit but for the NEPA process will not have additional stipulations added because they remain "committed to units or agreements that are producing." FEIS at 2-88.

Courts have recognized exactly this sort of "circular reasoning," as "arbitrary and capricious in violation of NEPA." Or. Wild v. BLM, No. 6:14-CV-0110-AA, 2015 WL 1190131, at *12 (D. Or. Mar. 14, 2015). Moreover, it is contrary to Congress' purpose of allowing unitization to extend leases only if doing so actually results in production of oil or gas in paying quantities. See Aera Energy LLC, 642 F.3d at 217; Wood Petroleum Corp., 47 F.3d at 1035.

2. Place Mesa Unit

The Place Mesa Unit includes three leases at issue in this NEPA process, all of which were issued 13 or more years ago: COC 66732, 66733, and 66926. FEIS at 1-5. BLM approved Encana's Place Mesa Unit on February 4, 2011 and assigned it number COC74749X. Letter from Jerome D. Strahan, BLM, to Encana (Feb. 4, 2011). Encana drilled an obligation well, Federal 28-11, within the first six month period. Letter from P.M. Di Grappa, Encana, to Roger Hall, BLM (Aug. 3, 2011); see also BLM Manual H-3180-1 at § II(E) (deadlines for drilling obligation well).²¹

But Encana failed to timely obtain the requisite water pipeline permits necessary to complete the well, and was unable to bring it into production in time to obtain a paying well determination before the next six month deadline (January 17, 2012). Letter from Jerome D. Strahan, BLM to P.M. Di Grappa, Encana (Feb. 1, 2012). BLM nevertheless granted Encana a four-month extension, through May 31, 2012, to demonstrate that the obligation well was capable of production in paying quantities. Id.

On May 16, 2012, Encana submitted a request for a paying well determination for well Federal 28-11H, noting its "understanding that the unit will remain in suspension until a determination can be made[.]" Letter from P.M. Di Grappa, Encana, to Roger Hall, BLM (May 16, 2012). BLM, however, never memorialized this "understanding" in writing and Encana's self-serving "understanding" did not serve to suspend the unit. Moreover, BLM did nothing to ensure that Encana complied with its drilling obligations during that period. Nearly a year later,

²¹ This well is not located on any of the leases at issue in this NEPA process. Letter from P.M. Di Grappa, Encana, to Roger Hall, BLM (Aug. 3, 2011); see also Farouche Decl. Attachment 4.

BLM approved Encana's paying well determination for Well Federal 28-11H, effective December 28, 2011. Letter from Jerome D. Strahan, BLM, to P.M. Di Grappa, Encana (Feb. 26, 2013).

On April 17, 2014, BLM approved an Initial Participating Area, effective December 28, 2011. Letter from Jerome D. Strahan, BLM, to Encana (Apr. 17, 2014). This Initial Participating Area does not include any of the leases at issue in this NEPA process. Compare id. at Ex. A (showing location of Participating Area) with FEIS at 2-8 (showing location of leases at issue in this NEPA process); see also Farouche Decl. Attachment 4. Thus, all three leases at issue in this NEPA process will be terminated from the unit on December 28, 2016, five years from the effective date of the Participating Area, unless Encana can prove it is in the process of drilling a well outside the Participating Area on that date. Reese & Reese, 2014 RMMLF at 4-13 to 4-14.

Encana, however, has not drilled any wells on the Place Mesa Unit since 2011. See Richard A. Champion, Encana, Place Mesa Unit 2012 Review of Operations and 2013 Plans of Development (Mar. 1, 2013); Richard A. Champion, Encana, Place Mesa Unit 2013 Review of Operations and 2014 Plans of Development at 1 (Feb. 28, 2014). As of August 26, 2016, the Place Mesa Unit File does not contain annual reports from 2014 or 2015, or any other evidence that Encana has drilled a single well in the Place Mesa Unit since 2011. The most recent evidence, a map attached to Encana's 2013 Review of Operations and 2014 Plan of Development, shows only a single well drilled on the entire unit. Id. at 2.

Encana's inactivity is consistent with its aforementioned decision to suspend its Piceance Basin operations. Supra p. 17. There also is no evidence in the record that Encana intends to drill a well outside the Place Mesa Unit's Initial Participating Area in the brief period between now and December 2016. Encana's lack of any drilling plans is even more apparent because the company has no Colorado state drilling permits for such wells.²² Thus, the three leases at issue in this NEPA process will terminate from the unit only a few weeks after BLM's expected decision. It would be arbitrary and capricious to reaffirm these leases on the ground that they are unitized, when that status will end almost immediately after BLM's decision.

Yet BLM ignored these facts and refused to add the requisite stipulations to the leases because they are "committed to units or agreements that are producing." It was arbitrary and capricious for BLM to ignore the highly pertinent data that the three leases will be terminated from the unit in just a few months, given Encana's failure to drill a single well on the Place Mesa Unit, inside or outside of the Participating Area, since 2011. See Coal. On W. Valley Nuclear Wastes v. Chu, 592 F.3d 306, 310 (2d Cir. 2009) (reversing decision where agency has "ignored pertinent data").

²² See COGCC Pending APDs, Mesa County (search run Aug. 22, 2016); COGCC, Approved APDs for Mesa County, Past Twelve Months (search run Aug. 22, 2016); COGCC, Colo. Oil and Gas Information Systems (COGIS) Facility Search: Wells, Mesa County, T9S, R96W (search run Aug. 22, 2016).

3. Willow Creek Unit

The Willow Creek Unit in the Thompson Divide (Zone 3) included seven leases. Six leases (COC 58835, COC 58836, COC 58837, COC 58838, COC 58840, COC 58841) were issued twenty years ago, in 1996, and held by WillSource Enterprise, LLC (WillSource). The seventh lease (COC 66913) was issued in 2003 and held by Encana.

All of these leases have stipulations that are grossly inadequate to protect natural resource values in the Willow Creek area. See DEIS Comments at 36–39. Moreover, the leases have been extended long past their ten-year lease term without any production. As outlined below, these leases should already have expired and BLM should confirm that they are terminated. At the very least, BLM must apply the Alternative 4 stipulations necessary to protect environmental values on these lands. It would be arbitrary and capricious for BLM to reaffirm these leases on the theory that they are “producing.”

In 2003, the seven Willow Creek leases were committed to the exploratory Willow Creek Unit (COC 67101X). The obligation well for the Unit was due to be drilled January 30, 2004. The operator failed to even submit an APD for the obligation well until June 15, 2004, and that well (the Little Beaver 1-20 on lease COC 58836) was not completed until November 11, 2004—more than 10 months after it was due. The well was immediately shut in and has never been put into production.

After that unit obligation well was drilled, the Willow Creek Unit Agreement required diligent drilling of additional wells.²³ But no new wells have been drilled in nearly 12 years. Instead, WillSource obtained several extensions of the deadline to drill obligation wells. In 2009, WillSource submitted its sixth request for an extension of the drilling deadline. The request was not approved by BLM based on the fact that so many extensions had already been granted. As a result, the Willow Creek Unit automatically contracted in November 2009. When contraction occurred, leases COC 58835, COC 58840, COC 58841 and COC 66913 were eliminated from the unit. Subsequently, all four leases have expired for lack of development.²⁴

²³ See e.g., Willow Creek Unit Agreement, Section 10 (requiring submission of plans of development providing for timely exploration and diligent drilling to determine areas capable of production).

²⁴ Three of the leases (COC 58835, COC 58840, COC 58841) were given two additional years on their terms pursuant to BLM regulations. No development occurred during those two years and the leases expired in November of 2011. Letter from Kathleen L. Toth, BLM, to WillSource Enterprise, LLC, re: Unit Contracted, Leases Eliminated (June 22, 2012) (DEIS Comments Appx. 1904); FEIS at 1-6 (Table 1-1). The fourth lease, held by Encana (COC 66913), had more than two years left in its term. DEIS Comments Appx. 1905. No development occurred on that lease during the remainder of its term, and it expired in late 2013. FEIS at 1-7 (Table 1-1).

WillSource has filed administrative appeals attempting to revive its three expired leases, and those appeals remain pending.²⁵ BLM, however, has repeatedly confirmed that the leases expired.²⁶ BLM should cancel these leases in its decision here so that the four leases are terminated, regardless of the outcome of the pending administrative appeals.

BLM views the remaining three leases (COC 58836, COC 58837, COC 58838) as remaining in the unit, and thus not expired, based on the 2004 well (Little Beaver 1-20) that has never produced but is deemed “capable of production.” DEIS Comments Appx. 1904. That well was shut in immediately after being drilled and has remained so for nearly 12 years.

The Willow Creek unit, however, automatically terminated years ago. BLM’s contrary view and its resulting reaffirmation of the three leases without new stipulations is arbitrary and capricious and contrary to law.

First, the unit automatically terminated pursuant to Unit Agreement Section 20. Section 20 provides that the unit automatically terminates five years after its 2003 effective date unless unitized substances have been discovered in paying quantities, “in which event” the unit agreement remains in effect so long as “unitized substances can be produced in [paying] quantities.” Unit Agreement ¶ 20(c). This provision thus requires both a valuable discovery and subsequent production. Because no production ever occurred, the Little Beaver 1-20 well did not extend the unit and it expired in 2008 – five years after the unit’s effective date. Id.

Alternatively, if BLM viewed drilling of the shut-in well as establishing production from the well, another clause of Section 20 caused the unit agreement to terminate even earlier, in 2004. Section 20(c) provides that if “production cease[s] and diligent drilling or reworking operations to restore production or new production are not in progress within 60 days and production is not restored or should new production not be obtained in paying quantities on committed lands within this unit area,” the unit agreement automatically terminates “effective the last day of the month in which the last unitized production occurred.” See Willow Creek Unit Agreement ¶ 20(c).

In this case, any hypothetical production ceased when the Little Beaver 1-20 well was completed in November 2004 and immediately shut in. The record shows that production (or diligent operations with that goal) did not occur within 60 days. On the contrary, the well has failed to produce for nearly twelve years. As a result, the Willow Creek Unit automatically terminated in 2004.

²⁵ Encana has not filed or joined in any administrative challenge to the expiration of COC 66913.

²⁶ See DEIS Comments Appx. 1904; Letter from Steve Bennett, BLM, to Reed F. Williams, WillSource Enterprise LLC, re: Decision on Suspension of Operations for Leases COC 58835, 58840 & 58841 (Dec. 17, 2012) (DEIS Comments Appx. 1906); BLM Mot. to Dismiss and Answer (IBLA No. 2012-292) 3–4 (Nov. 19, 2012) (DEIS Comments Appx. 1910–11).

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Furthermore, the unit has terminated for other reasons, which are discussed in the July 20, 2012 petition for state director review submitted by Wilderness Workshop and other groups regarding the decision to contract the unit, along with their June 8, 2012 comments on that issue. The Conservation Groups incorporate by reference the 2012 petition and comments, along with the documents submitted therewith. See Request for State Director Review from P. Hart, Wilderness Workshop, to H. Hankins, BLM (July 20, 2012) (SDR CO-12-09) (DEIS Comments Appx. 1880-86); Letter from P. Hart, Wilderness Workshop, to H. Hankins, BLM (June 8, 2012).

Because the unit has terminated, it is arbitrary for the Preferred Alternative to reaffirm these leases. Instead, the leases (to the extent they remain in effect at all, see below) should get the new stipulations provided under Alternative 4 in the FEIS.

Moreover, with the unit terminated in 2004 or 2008, the three non-producing leases that had been in the unit should have expired several years ago due to WillSource's failure to bring them into production. BLM should thus cancel these leases or confirm that they are expired.

Second, even if the Willow Creek unit did not terminate, the shut-in Little Beaver well did not prevent leases COC 58836, 58837 and 58838 from expiring. While a unit agreement may allow actual production on one lease to represent constructive production on the other leases in the unit, there must be actual production. Extension of a lease in a unit agreement requires "production of oil or gas in paying quantities under the plan. . . ." 43 C.F.R. § 3107.3-1. Similarly, Section 18(e) of the Willow Creek Unit Agreement provides that leases committed to the unit shall continue in force "provided that production of unitized substances in paying quantities is established under this unit agreement prior to the expiration date of the term of such lease." This language is clear: actual production—not just a well capable of producing—is required to extend unitized leases. BLM's reliance on a well that has never actually produced, and which has been shut in for 12 years, to treat all three leases (covering thousands of acres of public land) as remaining in force is contrary to the Mineral Leasing Act, as well as the regulations and the Willow Creek Unit Agreement.

Because the three Willow Creek leases have already expired, it is arbitrary and capricious for the Preferred Alternative to reaffirm them and purport to leave them in force. BLM should cancel these leases to confirm that they have terminated.

Third, given WillSource's extended failure to pursue diligent development, the Preferred Alternative's reliance on the unit agreement as the basis for reaffirming these leases flouts the intent of the Mineral Leasing Act and is arbitrary and capricious. Should WillSource decline to agree to Alternative 4 stipulations on these leases, BLM can readily terminate the unit agreement and cancel the leases. The history of these leases make it absurd for BLM to act as if its hands are tied here.

BLM can terminate the unit agreement because WillSource has flagrantly and repeatedly violated Section 10 of the Willow Creek Unit Agreement, which requires the company to submit regular plans that provide for "timely exploration of the unitized area, and for diligent drilling

necessary for determination of the area or areas capable of producing unitized substances in paying quantities in each and every productive formation.” Moreover, Section 10 required WillSource to exercise reasonable diligence in complying with approved operating plans. WillSource has repeatedly failed to file such reports, and BLM’s failure to enforce this provision for years is unreasonable. It also violates BLM regulations and the intent of the MLA’s unitization provisions. BLM has the authority to void the unit agreement for WillSource’s violations and failure to pursue diligent development. BLM should have exercised that right years ago.

It is arbitrary and capricious for BLM not to at least add Alternative 4 stipulations to these leases. The terms of the improperly-issued WillSource leases are wholly inadequate for protection of the area’s roadless lands, wildlife, plants and other resources. BLM must ensure that any leases that haven’t already expired are adequately stipulated to protect important environmental values in the area.

Finally, the FEIS covers one lease held by WillSource (COC 58839) that was not part of the Willow Creek unit. FEIS at 1-6 (Table 1-1). A well (WillSource 1-13) was drilled on COC 58839 in August 2001, promptly shut in, and has never produced. Because this 20-year-old lease has never been brought into production, it should have expired long ago. Given that lack of production, and the fact that this lease has not been committed to a unit, BLM’s extension of the lease past its primary term is arbitrary and capricious and inconsistent with the Mineral Leasing Act. BLM should cancel this lease or confirm that it has expired.

Moreover, the Preferred Alternative’s treatment of COC 58839 as “producing,” and reaffirmance of the lease with no changes, FEIS at 2-69 to 2-70, is arbitrary and capricious. The Preferred Alternative is especially problematic because the existing stipulations on COC 58839 are grossly inadequate to protect the resources there, which include fens, native cutthroat trout, roadless areas, steep slopes, threatened and endangered species, sensitive plants and aquatic species and old growth, among others. Compare FEIS at 2-4 (lease stipulations under Alternative 1) with id. at 2-39 (lease stipulations to be added under Alternatives 3 and 4). If BLM does not terminate COC 58839, it should at a minimum require that Alternative 4 stipulations be added to the lease to better protect these resources.

4. Middleton Creek Unit

The FEIS lists the status of leases COC 61121, 67147, 70013, and 70361 as “committed to Middleton Creek Unit.” FEIS at 1-5 to 1-6. This is incorrect. Leases COC 67147, 70013, and 70361 have been entirely eliminated from the Middleton Creek Unit, and lease COC 61121 was partially eliminated from the unit, effective August 20, 2015. Letter from Suzanne Mehlhoff, BLM, to Sarah Beck, Encana (Aug. 15, 2016); see also BLM Colorado, Decision at 1, 5, SDR CO-16-03 (June 27, 2016) (“SDR Decision”) (denying Encana’s request for State Director

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Review); Letter from Sarah Beck, Encana, to Peter Cowan, BLM (July 25, 2016) (Encana submitting list of the leases that were eliminated).²⁷

Thus, three of the leases classified in the FEIS as “committed to Middleton Creek Unit,” and most of the fourth lease, have been eliminated from the unit for more than a year. The FEIS’s statement that those leases are committed to the Middleton Creek Unit is demonstrably false. It would be arbitrary and capricious for BLM to reaffirm these leases under the Preferred Alternative, given that they are not committed to the Middleton Creek Unit. See Mo. Serv. Comm’n v. Fed. Energy Regulatory Comm’n, 337 F.3d 1066, 1075 (D.C. Cir. 2003) (“Reliance on facts that an agency knows are false at the time it relies on them is the essence of arbitrary and capricious decisionmaking.”).

V. THE GROUNDHOG GULCH LEASES SHOULD BE TERMINATED.

The Groundhog Gulch Unit includes three leases at issue in this NEPA process: COC 66915, 66916, and 66917. FEIS at 1-5. The FEIS treats them as “automatically extended upon unit termination” until November 11, 2016. Id. But this is incorrect: the leases should have expired as scheduled in 2013. Alternatively, even factoring in the improper extension, these leases are set to expire on November 11, 2016—a date shortly after BLM is expected to complete this NEPA process. It is arbitrary and capricious for BLM to ignore the pertinent data that the leases will expire so soon after this NEPA process is completed. See Coal. on W. Valley Nuclear Wastes, 592 F.3d at 310.

The Groundhog Gulch II Unit was approved in June 2013. See BLM, Case Recordation (Mass) Serial Register Page for Unit COC 75262X (Aug. 26, 2016). In late August 2013, Encana spud the Renninger #30-7-2 well on private lands adjacent to the White River National Forest. The well targeted private minerals, but it was intended to be the unit holder well for the Groundhog Gulch II Unit. The Renninger well was spud just 7 days before leases COC 066915 and 066916 were scheduled to expire on August 31, 2013, and just over a month before COC 066917 was scheduled to expire. See COGCC, COGIS – Well information for API # 05-077-10210 (Jan. 2, 2016) (DEIS Comments Appx. 1695–96); see also FEIS at 1-5 (all three leases issued on Sept. 1, 2003).

BLM later determined, however, that the Renninger well was unable to produce oil or gas in paying quantities on a unit basis. See Yates Petroleum Corp., 67 IBLA at 256–58

²⁷ Three of the leases lie entirely outside the Middleton Creek Participating Area, COC 68997C, and a portion of the fourth lease (COC 61121) is located outside the participating area. See Farouche Decl. Attachment 2 (showing location of Participating Area COC68997C relative to leases at issue in this NEPA process). These leases were eliminated because Encana failed to fulfill its continuous drilling obligations and the unit therefore contracted to include only the participating area. See Letter from John Schopp, Encana, to Suzanne Mehlhoff, BLM, at 2 (undated); Letter from Mark S. Barron, BakerHostetler, to Ruth Welch, BLM Colorado State Director (May 25, 2016).

(distinguishing standard for producing in paying quantities for the purposes of holding a unit and holding a lease). Accordingly, the agency terminated the Groundhog Gulch II Unit on November 11, 2014. In doing so, BLM treated the three federal leases as extended for two years after termination, because the unit holder well was being actively drilled when the leases were scheduled to expire in 2013. See Letter from Jerome D. Strahan, BLM, to Richard A. Champion, Encana Oil & Gas (USA), Inc. (Jan. 27, 2015) (DEIS Comments Appx. 1697); see also Letter from Kathleen L. Toth, BLM, to Encana (Mar. 21, 2016).

This determination was in error, because drilling the single Renninger well failed to satisfy the public interest requirement for unitization. The public interest requirement mandates that even after spudding the well in 2013, Encana continue to “diligently prosecute[] . . . operations in accordance with the terms of said agreement.” 43 C.F.R. § 3183.4(b). Section 9 of the Unit Agreement makes it very clear that the operator must drill at least one new well every six months (or, alternatively, two wells per year) until (a) it completes a well capable of producing in paying quantities, or (b) the land is proved incapable of such production. BLM, Unit Agreement for the Development and Operation of the Groundhog Gulch II Unit Area: Counties of Garfield and Mesa, State of Colorado § 9 (2012) (DEIS Comments Appx. 1703); see also 43 C.F.R. § 3186.1 ¶ 9 (model unit agreement).

After drilling the Renninger well in 2013, however, Encana did not drill another well within six months (or at all), as required by the unit agreement. But there is no indication in BLM’s unit termination decision that either of the conditions excusing such drilling were met: (a) Encana never completed a well capable of producing in paying quantities, and (b) there was no determination that the land was incapable of such production.

This failure meant that Encana never satisfied the public interest requirement for unitization under 43 C.F.R. § 3183.4(b). If the public interest requirement is not met, the two-year extension granted by BLM is unavailable. See 43 C.F.R. § 3183.4(b) (if unit agreement terminated without public interest requirement being satisfied, “no Federal lease shall be eligible for extensions under § 3107.4 of this title”). Thus, BLM’s prior approval of the unit agreement was “invalid ab initio.” See Handbook H-3180-1 at 2-51 (unit approval form states that “[t]his approval shall be invalid ab initio if the public interest requirement under § 3183.4(b) of this title is not met”). The invalid unit approval means that the unit agreement could not have extended the three leases past their 2013 expiration dates. It was thus arbitrary and capricious and in violation of the agency’s own regulations for BLM to extend leases COC 66915, 66916, and 66917 by two years. See Permian Basin Petroleum Ass’n v. Dep’t of the Interior, 127 F. Supp. 3d 700, 712 (W.D. Tex. 2015) (agency’s failure to follow its own regulations is arbitrary and capricious). These leases expired in 2013, and they should accordingly be deemed terminated.

Moreover, there is no indication that Encana plans to bring these leases into production before the extended November 2016 expiration date. In December 2013, after drilling the Renninger well, Encana suspended drilling operations in the Piceance Basin. See supra p. 17. The company currently has no APDs on these leases pending with either BLM or the COGCC.

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These leases should be terminated, either by cancelling them or by confirming that they have expired.

CONCLUSION

The Conservation Groups appreciate and support BLM's reconsideration of the 65 improperly-issued leases. BLM's Preferred Alternative in the FEIS, however, should not be adopted. Instead, all 65 leases should be cancelled. At a minimum, BLM should modify its Preferred Alternative to apply Alternative 4 to all 40 of the leases that are not cancelled.

Thank you for your consideration of these comments.

Sincerely,

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cc: Peter Hart

/Enclosure (thumb drive with Appendix of exhibits)

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From: SI_WRNFleases, BLM_CO
To: mfreeman@earthjustice.org
Subject: Thank you for your email Re: Comments on FEIS for 65 Improperly Issued Leases in White River National Forest
Date: Friday, September 2, 2016 10:50:18 AM

Thank you for your email regarding the Environmental Impact Statement (EIS) for the Previously Issued Oil and Gas Leases in the White River National Forest.