February 25, 2013

SUBMITTED ELECTRONICALLY

Bureau of Land Management
Attn: Mark Ames
Rawlins Field Office
P.O. Box 2407 (1300 North Third Street)
Rawlins, WY 82301-2407
Email: BLM_WY_Continental_Divide_Creston@blm.gov

RE: Comments on the Air Quality Analysis for the November 2012 Continental Divide-Creston Natural Gas Development Project Draft Environmental Impact Statement (DEIS)

Dear Mr. Ames:

I am writing to submit comments on the November 2012 Continental Divide-Creston Draft Environmental Impact Statement (DEIS). My comments pertain to the air quality portions of the DEIS. These comments were developed under contract to the Wyoming Outdoor Council.

The air quality modeling analyses performed by the BLM for the DEIS indicate that adverse impacts on air quality would occur due to the proposed development sources alone and cumulatively when considering other sources in the region. These adverse impacts will further exacerbate existing air quality conditions that threaten violation of air quality standards. Background data and other analyses indicate that compliance with National Ambient Air Quality Standards (NAAQS) and Wyoming Ambient Air Quality Standards (WAAQS) is threatened, significant air quality deterioration is not being prevented and visibility impairment and ecosystem impacts are already occurring due in part to current and proposed future development of oil and gas resources in the area. An analysis of these impacts is detailed in the attachment to this letter. Further, the air quality analyses presented in the DEIS and accompanying air quality technical support documents are deficient as detailed in the attachment to this letter. As a result of these deficiencies, it is likely that air quality impacts would be predicted to be even more extensive than what is presented in the DEIS.

Specifically, the attachment to this letter includes detailed comments on the following air quality issues that this DEIS must better address:

- BLM's air quality modeling analysis predicts significant ozone, NO_2 and PM impacts.
- BLM's air quality modeling analysis predicts unacceptable health risks associated with hazardous air pollutant impacts.

- BLM's air quality modeling analysis predicts significant cumulative visibility impacts.
- BLM's air quality modeling analysis predicts significant direct and cumulative ecosystem impacts.
- BLM's air quality modeling analysis does not assure the prevention of significant deterioration of air quality.
- BLM's air quality modeling analysis is deficient and likely underestimates impacts.
- The DEIS does not sufficiently address greenhouse gas emissions and climate change impacts from the proposed development.
- The DEIS does not include mitigation measures that will ensure there will be no adverse impacts from the proposed development.

The DEIS does not adequately analyze the air quality impacts that could occur as a result of the actions authorized under the proposed alternatives, and therefore fails to comply with the National Environmental Policy Act (NEPA). The air analysis included in the DEIS is not a comprehensive assessment of the environmental and public health impacts resulting from an increase in air pollution in an area already impacted by the adverse effects of increasing development. Without a more thorough analysis, BLM cannot know what the full impacts of the development activities proposed in the DEIS will be on air quality, human health and the natural environment or whether the BLM will prevent significant deterioration in air quality, as required by the Clean Air Act.

The Proposed Action includes the construction and operation of 8,950 natural gas wells, associated roads and production facilities, including compression and gas processing facilities. The proposed natural gas wells would be drilled either conventionally or with multiple directional wells from a single pad. BLM does not put forth any alternative in the DEIS that fully protects air quality in the area. All of the alternatives fall short of establishing enforceable mitigation measures that will ensure no violations of the applicable State and Federal requirements. BLM must propose a detailed and enforceable mitigation plan and consider that plan in detail as a component of alternatives in the DEIS, using any and all means, <u>prior</u> to issuance of the final EIS, that will ensure no violations of Clean Air Act standards and, further, adherence to thresholds established by best available science regarding protection of public health and the environment. If the BLM authorizes this development, as proposed, its actions will not ensure protection of air resources. BLM must improve upon its air quality analysis and then must develop and adopt an alternative that ensures no violations of Clean Air Act standards.

I have many years of experience working on air quality issues. My curriculum vitae is enclosed for further information on my expertise. Based on my air quality experience, I believe the Continental Divide-Creston Natural Gas Development DEIS will have potentially significant adverse impacts on air quality and that those impacts have not been adequately disclosed or addressed in the DEIS.

Thank you for consideration of these comments. Please include me on the mailing list for any future actions on the Continental Divide-Creston Natural Gas Development DEIS.

Sincerely,

Megan M. Williams
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cc: Steve Dietrich, DEQ

Ken Distler, EPA

Charis Tuers, BLM

Attachments

ATTACHMENT

Detailed Air Quality Comments on the Continental Divide-Creston Natural Gas Development Draft Environmental Impact Statement

I. BLM's Own Assessment Indicates the Proposed Development Will Have Adverse Impacts on Air Quality and Therefore the DEIS—Which Does Not Fully Acknowledge Such Impacts—Does not Satisfy the Requirements of the National Environmental Policy Act and the Federal Land Policy and Management Act

BLM's analysis in the DEIS shows adverse impacts on air quality. Specifically, the BLM's own analysis fails to ensure compliance with the National Ambient Air Quality Standards (NAAQS) and Wyoming Ambient Air Quality Standards (WAAQS), predicts unacceptable health risks associated with hazardous air pollutant impacts and shows numerous adverse impacts to visibility and ecosystems in nearby Class I and sensitive Class II areas. BLM's analysis also does not ensure that the project will prevent significant deterioration of air quality. In short, the DEIS does not satisfy the BLM's obligations under the National Environmental Policy Act (NEPA) and the Federal Land Policy and Management Act (FLPMA) to disclose whether the proposed development will cause Clean Air Act (CAA) violations, and to consider alternatives that better mitigate air pollution under NEPA, and to adopt mitigation under FLPMA, to prevent CAA violations and to prevent unnecessary or undue degradation of public lands and the environment (43 U.S.C. § 1732(b)).

Under NEPA, the BLM has obligations to assess and report the near-field, far-field and cumulative impacts of expected emissions from the proposed project on the NAAQS, prevention of significant deterioration (PSD) increments, and air quality related values (AQRVs), and to identify alternatives or other mitigation measures sufficient to prevent expected violations of NAAQS, PSD increments and adverse impacts on AQRVs. (40 C.F.R. §§ 1502.14(a), (f), 40 C.F.R. § 1502.16(h) and 40 C.F.R. § 1508.27(b)(10)). Furthermore, FLPMA mandates that, "[i]n the development and revision of land use plans, the Secretary shall . . . (8) provide for compliance with applicable pollution control laws, including State and Federal air, water, noise, or other pollution standards or implementation plans…"(43 U.S.C. § 1712(c)(8)). This statute is implemented with the following regulation:

> Each land use authorization shall contain terms and conditions which shall: (3) Require compliance with air and water quality standards established pursuant to applicable Federal and State law. 43 C.F.R. § 2920.7(b)(3)

Compliance with this regulation assists, although it does not necessarily ensure, the BLM's compliance with FLPMA's duty to prevent unnecessary or undue degradation of public lands and the environment. 43 U.S.C. § 1732(b). Providing even more detail, the BLM's own Land Use Planning Handbook explains that the analysis of alternatives in the draft EIS must

> … provide adequate information to evaluate the direct, indirect, and cumulative impacts of each alternative in order to determine the best mix of potential planning decisions to achieve the identified goals and objectives (the analysis should also specifically address the attainment, or non-attainment, of Land Health Standards expressed as goals). The assumptions and timeframes used for analysis purposes (such as reasonably foreseeable development scenarios) should be documented.[1]

And more directly, the Rawlins Resource Management Plan (2008) identifies the following management objectives and impact significance criteria, which must be adhered to in this DEIS:

> **Management Objectives**
>
> > Maintain concentrations of criteria pollutants associated with management actions in compliance with applicable state and federal ambient air quality standards.
> >
> > Maintain concentrations of PSD pollutants associated with management actions in compliance with the applicable increment.
> >
> > Reduce visibility-impairing pollutants in accordance with the reasonable progress goals and time frames established within the State of Wyoming's Regional Haze State Implementation Plan (SIP).
> >
> > Reduce atmospheric deposition pollutants to levels below generally accepted Levels of Concern and Limits of Acceptable Change.
>
> **Significance Criteria**
>
> > If and when specific activities are proposed at the implementation stage requiring quantitative analysis, impacts to air quality would be compared to the following significance criteria:
> >
> > > The National Ambient Air Quality Standards (NAAQS) or Wyoming Ambient Air Quality Standards (WAAQS),

[1] BLM, "Land Use Planning Handbook," H-1601-1, March 11, 2005, 22.

The applicable PSD increments,

Federal guidelines for visibility impairment and atmospheric deposition.[2]

In order to meet its obligations under NEPA and FLPMA and the underlying resource management plan, the BLM must identify an allowable level of emissions for the proposed development that would not cause or contribute to violations of pollution standards in the ambient air or adverse impacts on air quality related values in Class I areas, and identify mitigation measures to achieve those emission levels. NEPA explicitly requires that the EIS for the development "shall include discussions of: . . . (h) Means to mitigate adverse environmental impacts (if not fully covered under § 1502.14(f))." Where "[m]itigation includes: (a) avoiding the impact altogether by not taking a certain action or parts of the action; (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation." 40 C.F.R. § 1508.20. Furthermore, the requirement of FLPMA to "provide for compliance" with these standards re-enforces the requirement of NEPA that the EIS identify the measures available to BLM to provide for compliance with CAA requirements. 43 U.S.C. § 1711(c)(8).

In its EIS analysis, BLM must include all information relevant to reasonably foreseeable significant adverse impacts and must fully justify any incomplete or unavailable information per the requirements of 40 C.F.R. § 1502.22.

BLM has failed to accomplish this in this DEIS. Importantly, the proposed action is shown to violate several of the air quality standards laid out by the CAA and mandated for NEPA projects under FLPMA. The Proposed Action would result in adverse impacts to air quality and air quality related values. Specifically, the DEIS and associated support documents report modeled exceedances of the NO_2 and $PM_{2.5}$ NAAQS, exceedances of the PM_{10} WAAQS, contributions to unhealthy ozone levels, unacceptable health risks associated with hazardous air pollutant impacts, significant deterioration of air quality and numerous visibility and ecosystem impacts. Even more troublesome is the fact that the modeling likely underestimates impacts, does not fully disclose the maximum potential impacts and understates background air quality levels in the area meaning that the adverse air quality impacts would likely be much worse, in reality, than what is shown in this DEIS.

II. BLM's Analysis Predicts Significant Air Quality Impacts

Ozone Impacts From the Proposed Development are Significant

[2] BLM CD-C DEIS p. 4-41.

In 2008, the State of Wyoming issued three ozone advisories in the winter for the Pinedale region in the Upper Green River Basin. The Wyoming Department of Environmental Quality's Air Quality Division (WDEQ-AQD) has concluded that the elevated ozone levels are primarily due to the area's intensive oil and gas development activities.[3] The high wintertime ozone concentrations have resulted in a nonattainment designation, effective July 20, 2012, for Sublette and parts of Lincoln and Sweetwater Counties, not far west of the proposed development area.[4] Ozone pollution is a significant concern in the proposed development area, which lies directly east of the ozone nonattainment area, in the direction of prevailing winds.

The importance of protecting the air quality for those people who live in the region, most importantly for sensitive populations, including children, the elderly and those with respiratory conditions is great. 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.[5] And in 2008 the National Academy of Sciences concluded, "short-term exposure to current levels of ozone in many areas is likely to contribute to premature deaths".[6]

In 2008, EPA revised the 8-hour ozone standard (NAAQS) from 80 ppb to 75 ppb and in January of 2010 proposed even stricter standards, between 60 and 70 ppb.[7] EPA has since decided to continue implementing the 75 ppb standard until the next regularly scheduled regulatory review, which will occur beginning this year (in 2013).[8] The Clean Air Scientific Advisory Committee (CASAC) — appointed by the EPA Administrator to recommend revisions to the existing standards, per section 109(d)(2) of the Clean Air Act—recommended in 2008 that EPA substantially lower the 8-hour standard. At that time the EPA did not abide by the committees recommendations. Specifically, the CASAC put forth a unanimous recommendation to lower the 8-hour standard from 80 ppb to

[3] BLM CD-C AQTSD at 1-7.
[4] *See* EPA's final designation at 77 FR 30088, May 21, 2012 and EPA's April 30, 2012 letter to Wyoming Governor Matt Mead at http://deq.state.wy.us/aqd/downloads/Nonattainmentletter4_30_12.pdf.
[5] *See* EPA's National Ambient Air Quality Standards for Particulates and Ozone, 62 FR 38,856 (July 18, 1997).
[6] *See* National Academy of Sciences April 22, 2008 Press Release, available online at http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=12198, and the full report from the National Research Council entitled Estimating Mortality Risk Reduction and Economic Benefits from Controlling Ozone Air Pollution published by the National Academies Press, 2008, available online at http://www.nap.edu/catalog.php?record_id=12198.
[7] *See* 73 FR 16436, Effective May 27, 2008 and 75 FR 2938, January 19, 2010.
[8] Note, the 2008 standard is currently under legal challenge. *See*, September 22, 2011, EPA Memo, Implementation of the Ozone National Air Quality Standard, http://www.epa.gov/ozonepollution/pdfs/OzoneMemo9-22-11.pdf.

somewhere between 60-70 ppb.[9] The committee concluded that there is no scientific justification for retaining the current 8-hour standard and that the EPA needs to substantially reduce the primary 8-hour standard to protect human health, especially in sensitive populations. Again in 2010, the CASAC expressed its full support for lowering the NAAQS to within the 60-70 ppb range. The CASAC affirmed that, "in proposing this range, EPA has recognized the large body of data and risk analyses demonstrating that retention of the current standard would leave large numbers of individuals at risk for respiratory effects and/or other significant health impacts including asthma exacerbations, emergency room visits, hospital admissions and mortality."[10] So, even ozone concentrations at levels as low as 60 ppb can be considered harmful to human health and the BLM should consider this when evaluating the air impacts in the DEIS, including by considering, in detail, an alternative in the DEIS pursuant to NEPA that would constrain impacts to within the 60-70ppb range recognized by the CASAC, regardless of what EPA eventually chooses to do in 2013, as the BLM has a duty — independent of the CAA — to protect public health and the environment. Based on the recent monitoring data from the project development area, background concentrations of ozone are already at a level of concern with respect to health impacts. The DEIS must disclose and analyze this fact.

The DEIS presents a background concentration for ozone of 126.1 micro grams per cubic meter ($\mu g/m^3$) – approximately 64 parts per billion (ppb) – in Table 3.5-8 of the DEIS (p. 3-63). This value is reported as the 3-year average of the 4th highest maximum 8-hour average concentration for years 2008 through 2010 at the Federal Reference Method monitor operated by the state of Wyoming and located in Wamsutter, in the southeast portion of Sweetwater County in the heart of the project development area. Maximum daily average ozone concentrations at this same location ranged from 66 ppb up to 87 ppb between 2008 and 2012.[11] This monitor recorded a wintertime exceedance of the O_3 NAAQS in February 2008.[12] In the DEIS, diurnal plots for Wamsutter show almost complete depletion of ozone concentrations overnight, suggesting the monitor may be sited too close to a NO_x source to be representative.[13] Detailed descriptions should be provided in the DEIS for the monitoring sites in the project area, including the Wamsutter site.

The DEIS shows that the 4th maximum 8-hour average ozone concentrations at monitoring sites at Wamsutter, Sun Dog, Atlantic Rim, Moxa Arch, OCI and

[9] EPA-CASAC-LTR-07-001, Clean Air Scientific Advisory Committee's (CASAC) Peer Review of the Agency's 2nd Draft Ozone Staff Paper, October 24, 2006.
[10] EPA-CASAC-10-007, Review of EPA's proposed Ozone National Ambient Air Quality Standard, February 19, 2010.
[11] EPA AirData, http://www.epa.gov/airdata/ad_maps.html
[12] EPA AirData, http://www.epa.gov/airdata/ad_maps.html
[13] BLM CD-C AQTSD Appendix A, Figures A4-7c, A4-9c and A4-10c.

South Pass are all routinely above 60 ppb, and in some years exceed 70 ppb.[14] The DEIS also shows there were 11 days in 2006 when concentrations at the Wamsutter monitoring site exceeded 65 ppb.[15] (Monitoring began at the Wamsutter site in 2006 so no 2005 data are available.) Thus, the region is already showing ozone levels that would be considered nonattainment if EPA eventually adopts a lower standard as proposed in January 2010. Essentially, there is no room for growth in emissions that contribute to these harmful levels of ozone pollution in the region — namely, NO_x and VOC emissions. Yet, for the proposed action the DEIS reports an additional 6,700 tons per year of NO_x emissions from new and existing sources in the projected year 2022 inventory and almost 57,000 tons per year of additional VOC emissions from new and existing sources in 2022.[16] These emissions estimates far exceed other reasonably foreseeable development (RFD) project emissions in the area by a large margin with NO_x emissions from the proposed action exceeding all NO_x emissions from the Jonah, Pinedale, Hiawatha (proposed action) and Moxa Arch (preferred alternative) development projects combined.[17] Similarly, VOC emissions from the proposed action from new and existing sources of 57,000 tons per year are well over the total for all other RFD project VOC emissions combined.[18] BLM must demonstrate as part of this DEIS that these significant NO_x and VOC emissions increases will not threaten the impacted area's compliance with the ozone NAAQS—including a reduced level in the 60-70 ppb range that is likely under the upcoming NAAQS revision this year—or interfere with the adjacent nonattainment area's plans for attaining and maintaining the ozone standard.

BLM must ensure that the proposed project will not interfere with the Wyoming State Implementation Plan (SIP) to attain the ozone NAAQS. Specifically, BLM should consider the impact from the proposed development on any general conformity requirements imposed in the nonattainment area. General conformity requirements apply to federal actions that are not covered by transportation conformity requirements and could include further analysis and action based on predicted ozone impacts to the nonattainment area. The purpose of the General Conformity Rule is to ensure that federal activities do not cause or contribute to new violations of the NAAQS or worsen existing violations and also to ensure that attainment of the NAAQS is not delayed. BLM has an obligation in this DEIS to determine whether the project impacts will conform to the SIP, including general conformity requirements.

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[14] BLM CD-C AQTSD Table 4-12 at 4-40 – 4-42 and BLM CD-C AQTSD Appendix A, Table A4-2, 3 and 4.
[15] BLM DC-D AQTSD Appendix A Tables A4-2, 3 and 4.
[16] BLM CD-C DEIS Table 4.5-2 at 4-44 and BLM CD-C AQTSD Figure 2-4 at 2-31.
[17] BLM CD-C DEIS Table 4.5-2 at 4-44, BLM CD-C AQTSD Figure 2-4 at 2-31 and BLM CD-C AQTSD Table 2-6 at 2-52.
[18] BLM CD-C AQTSD Table 2-6 at 2-52.

The DEIS shows that the proposed action will increase ozone levels in the area. The Modeled Attainment Test Software (MATS) analysis for the 2008 and 2022 emissions scenarios using 2005 and 2006 meteorology show current design value estimates in the vicinity of the CD-C project area in the 60-69 ppb range.[19] Results for 2022 indicate that the 4th highest maximum design value concentrations throughout the project area would be around 65 ppb.[20] The source apportionment analysis in the DEIS shows contributions from CD-C sources of up to 0.8 ppb to 2022 ozone concentrations with CD-C development impacts generally highest within and to the east of the CD-C project area.[21] As discussed in the DEIS (*e.g.*, DEIS at 4-38 to 4-39), however, the MATS analysis is not reliable because relative response factors were estimated from as few as one day of simulations. EPA's recommended approach calls for an absolute minimum of 5 days at or above the minimum allowable threshold (in this case, 60 ppb) per site when establishing relative response factors for use in the modeling.[22] Relative response factors that are based on fewer than 5 days of modeled results above 60 ppb would not be acceptable for use in predicting ozone concentrations according to EPA guidance.[23]

With respect to the model performance in the unmonitored areas, the reliability of the predictions is also severely limited, in this case, by the scarcity of monitors on which to base the interpolations.

The absolute modeling results using 2005 meteorology show CD-C project sources contributing to increases in ozone concentrations by as much as 2.2 ppb from 2008 to 2022 in the CD-C project area and downwind (east) of the project area.[24] CD-C project sources are also shown to contribute to increases in ozone concentrations in the range of 0.25-0.75 ppb in Fremont County (north and west of the project area) and up to 0.1 ppb in Sublette, western Sweetwater and Lincoln Counties, where ozone concentrations already exceed the NAAQS.[25] Further, the DEIS shows that CD-C project sources contribute up to 0.23 ppb to ozone concentrations at sites that exceeded 75 ppb (*e.g.*, CD-C project source emissions contributed 0.23 ppb of the modeled daily maximum 8-hour average ozone concentration of 86 ppb at the Wamsutter monitor in the project

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[19] *See* BLM CD-C DEIS at 4-44, 4-45, 4-47 and 4-48. Note that the modeled 2008 design values are reported to be higher using 2006 meteorology data with, "a larger area of southwestern Wyoming that exceeds 66 ppb and more grid cells in Sublette County that exceed the 75 ppb NAAQS."

[20] BLM CD-C AQTSD at 4-43 Table 4-13.

[21] BLM CD-C DEIS at 4-50.

[22] *See* EPA, Modeled Attainment Test Software, User's Manual, March 2009, p.p. 144 and 190, available online at http://www.epa.gov/scram001/guidance/guide/MATS-2-2-1_manual.pdf.

[23] EPA, Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$ and Regional Haze, EPA-454/B-07-002, Research Triangle Park, NC, 2007.

[24] BLM CD-C DEIS at 4-55.

[25] BLM CD-C DEIS at 4-55.

development area based on 2006 meteorology data).[26]

The ozone modeling analysis presented in the DEIS, therefore, shows that the CD-C proposed action contributes to unhealthy ozone levels. This fact must be fully disclosed and analyzed in the CD-C EIS, and mitigation measures put in place to prevent these impacts.

BLM's Air Quality Modeling Analysis Predicts Significant NO_2 Impacts

In 2010, EPA adopted a new 1-hour average standard (NAAQS) for NO_2 to protect against respiratory effects that result from elevated short-term exposures.[27] According to EPA, "studies show a connection between breathing elevated short-term NO_2 concentrations, and increased visits to emergency departments and hospital admissions for respiratory issues, especially asthma."[28] The DEIS analysis predicts significant NO_2 impacts from the Proposed Project.

Multiple modeled scenarios show that when project impacts are added to background concentrations the 1-hour NO_2 NAAQS would be exceeded. Specifically, for the proposed action, the two modeled development scenarios for NO_2 show a 1-hour average NO_2 concentration at 100 meters, when added to the background concentration presented in the DEIS, of 198.5 $\mu g/m^3$ (106% of the NAAQS) and 200.6 $\mu g/m^3$ (107% of the NAAQS).[29] <u>Note, since minimum setbacks in Wyoming are 350 feet (106 meters), the 100-meter distance – not 250-meter distance – is the most relevant distance for consideration of health impacts from air pollution</u>.[30] In addition, the 16 well pad production scenario modeled for the proposed action results in a 1-hour NO_2 concentration, when added to the background concentration, that is essentially at the level of the NAAQS (187.6 $\mu g/m^3$ compared with the NAAQS of 188 $\mu g/m^3$).[31] Similar modeled impacts are also shown for the Alternatives presented in the DEIS. One of the modeled development scenarios for Alternative A resulted in 1-hour NO_2 concentrations at 100 meters that are 111% of the NAAQS.[32] According to the DEIS, near-field impacts for Alternatives B, C and D are similar to the proposed action with modeled exceedances of the 1-hour NO_2 NAAQS occurring at 100 meters from the two development scenarios modeled and from the 16 well pad production scenario.[33]

BLM's Air Quality Modeling Analysis Predicts Significant Particulate Matter

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[26] BLM CD-C DEIS Table 4-15 at 4-60.
[27] 75 FR 6474, Feb. 9, 2010.
[28] EPA, http://www.epa.gov/airquality/nitrogenoxides/health.html
[29] BLM CD-C DEIS Table 4.5-5a p. 4-51.
[30] *See* 055-000-003 Wyo. Code R. Section 22(b) (available online at soswy.state.wy.us/Rules/RULES/7188.pdf)
[31] BLM CD-C DEIS Table 4.5-4a p. 4-50.
[32] BLM CD-C DEIS Table 4.5-13a p. 4-60.
[33] BLM CD-C DEIS pp. 4-62; 4-63; 4-64.

Impacts

Multiple modeled scenarios show that when project impacts are added to background concentrations the 24-hour $PM_{2.5}$ NAAQS and the 24-hour PM_{10} WAAQS would be exceeded. Specifically, for the proposed action, modeling of a single well pad and access road shows a 24-hour average $PM_{2.5}$ concentration at 100 meters, when added to the background concentration, of 40.6 μg/m^3 (116% of the NAAQS) and a 24-hour average PM_{10} concentration at 100 meters, when added to the background concentration, of 179.2 μg/m^3 (119% of the WAAQS).[34] And again, since minimum setbacks in Wyoming are 350 feet, the 100-meter distance is the most relevant distance for consideration of health impacts from air pollution.[35] Similar modeled impacts are also shown for the Alternatives presented in the DEIS. The maximum modeled development scenario for Alternative A resulted in 24-hour $PM_{2.5}$ and PM_{10} concentrations at 100 meters that are 116% of the NAAQS and 119% of the WAAQS, respectively.[36] According to the DEIS, near-field impacts for Alternatives B, C and D are similar to the proposed action with modeled exceedances of the 24-hour $PM_{2.5}$ NAAQS and PM_{10} WAAQS occurring at 100 meters from the maximum development scenario modeled (*i.e.*, single well pad and access road construction).[37]

In 2006, EPA lowered the short-term $PM_{2.5}$ standard from 65 μg/m^3 to 35 μg/m^3 because scientific information showed that the pollutant is a health concern at levels lower than what the previous standard allowed.[38] $PM_{2.5}$ 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. $PM_{2.5}$ is also a major contributor to visibility impairment. *See* the EPA's staff paper on particulate matter (EPA-452/R-05-005a, December 2005) as well as the EPA's Air Quality Criteria Document for Particulate Matter (EPA/600/P-99/002aF and EPA/600/P-99/002bF, October 2004) for more detailed information on the health effects of $PM_{2.5}$.[39] Even $PM_{2.5}$ concentrations lower than the current NAAQS are a concern for human health. The CASAC, in a letter to the EPA on the 2006 revised $PM_{2.5}$ standard, unanimously recommended that the 24-hour $PM_{2.5}$ standard be lowered from 65 μg/m^3 to 30-35 μg/m^3 and that the annual standard be lowered from 15 μg/m^3 to 13-14 μg/m^3.[40] EPA set the standard on

[34] BLM CD-C DEIS Table 4.5-5a p. 4-51.
[35] 055-000-003 Wyo. Code R. Section 22(b)
[36] BLM CD-C DEIS Table 4.5-13a p. 4-60.
[37] BLM CD-C DEIS pp. 4-62; 4-63; 4-64.
[38] 71 FR 61236, effective December 18, 2006.
[39] *See* http://www.epa.gov/ttn/naaqs/standards/pm/data/pmstaffpaper_20051221.pdf and http://cfpub2.epa.gov/ncea/cfm/recordisplay.cfm?deid=87903.
[40] EPA-CASAC-LTR-06-003, Clean Air Scientific Advisory Committee Recommendations Concerning the Final National Ambient Air Quality Standards for Particulate Matter, September 29, 2006, http://yosemite.epa.gov/sab/SABPRODUCT.NSF/1C69E987731CB775852571FC00499A10/$File/casac-ltr-06-003.pdf.

the high end of the CASAC recommended range for the short-term standard and, at the time, chose not to lower the annual standard. In response, the CASAC made it clear that their recommendations were based on "clear and convincing scientific evidence" and, furthermore, that their recommendations were "consistent with the mainstream scientific advice that EPA received from virtually every major medical association and public health organization that provided their input to the Agency".[41] EPA recently finalized a strengthened $PM_{2.5}$ annual standard of 12 µg/m^3.[42] <u>BLM must update the DEIS to reflect this new standard, which was effective immediately, and must also consider the new, lower, standard in its impact analyses.</u>[43] Further, BLM should consider that significant impacts can occur at 24-hour $PM_{2.5}$ concentrations as low as 30 µg/m^3.

In addition to wintertime ozone, wintertime $PM_{2.5}$ is a growing concern near oil and gas development. And even though there are no $PM_{2.5}$ monitors located within the project area, exceedances of the $PM_{2.5}$ standard have been recorded nearby in Rock Springs and Lander.[44] In oil and gas development areas in northeast Utah, air quality monitors have recorded very high wintertime values of 24-hour average $PM_{2.5}$. Speciation studies completed on samples collected in the Uinta Basin found that the sources that contribute to the high concentrations (organic and elemental carbon sources) are different than those seen in the urban areas of the Wasatch Front and Cache Valley (mostly ammonium nitrate from combustion sources (NO_x)) with the large fraction of carbon material found in the samples from the Uinta Basin (up to 80% of the $PM_{2.5}$ by mass) indicating a "likelihood of strong regional contributions of the oil and gas industry to the atmospheric hydrocarbon (VOC) burden of the Uinta Basin's airshed."[45] With maximum monitored 24-hour average $PM_{2.5}$ concentrations occurring primarily in winter in Rock Springs and Lander, it is important for the BLM to closely monitor wintertime $PM_{2.5}$ concentrations in the project area. BLM should establish monitoring requirements for the project area to help manage $PM_{2.5}$ impacts.[46]

The Hazardous Air Pollutant Analysis in the DEIS Predicts Significant Health Impacts

[41] *Id.*
[42] 78 FR 3086, January 15, 2013.
[43] *E.g.,* BLM CD-C DEIS Table 3.5-4.
[44] EPA AirData, max 24-hour $PM_{2.5}$ concentration in 2012 at the Rock Springs $PM_{2.5}$ monitor (ID 56-037-0007) was 37.6 µg/m^3 (on 9/21/12), or 107% of the NAAQS, and max 24-hour $PM_{2.5}$ concentration in 2009 at the Lander $PM_{2.5}$ monitor (ID 56-013-1003) was 37.8 µg/m^3 (on 12/9/09), or 108% of the NAAQS. Note, concentrations at this monitor are reported under Local Conditions
[45] Energy Dynamics Laboratory, Utah State University Research Foundation, Final Report: Uinta Basin Winter Ozone and Air Quality Study December 2010-March 2011, EDL/11-039, June 14, 2011, p. 71.
[46] EPA AirData, max 24-hour $PM_{2.5}$ concentrations occurred in winter in the following years in Rock Springs: 2/21/08, 1/11/10, 3/19/11 and in Lander: 1/22/08, 12/9/09, 1/5/10, 2/11/11.

The hazardous air pollutant (HAP) analysis presented in the DEIS shows that significant health impacts would result from the proposed development. With minimum setbacks in Wyoming of 350 feet (106 meters), the 100-meter distance – not 250-meter distance – is the most relevant distance for consideration of health risks from air pollution.[47]

Modeling results for the 16-well pad production scenario show formaldehyde concentrations approaching the reference exposure level (REL) with predicted concentrations at 100 meters of 47.3 $\mu g/m^3$ compared with the REL of 55 $\mu g/m^3$.[48] Results for the 32-well pad scenario show formaldehyde concentrations above the REL.[49]

The DEIS also shows that combined cancer risks for the 16-well case are elevated (up to 21×10^{-6}).[50] Cancer risk levels of up to 100×10^{-6} should not be viewed as acceptable.[51] The EPA Superfund National Oil and Hazardous Substances Pollution Contingency Plan criteria cited in the DEIS do not represent acceptable risk levels for other purposes.[52] EPA strives to limit individual lifetime risk to no higher than 1 in 1 million (1×10^{-6}) and BLM must consider this risk threshold when assessing cancer risk from the proposed development.[53] In addition, use of a 9-year residency assumption for calculating the most likely exposure (MLE) is not warranted and is not adequately protective.[54] This number, as discussed in the DEIS, is meant to represent a national average value, and dates to the early 1990's. It is not at all clear that it represents current residency patterns in southern Wyoming. BLM must determine and then use a more locally-specific adjustment for calculating the MLE scenario. Finally, combined cancer risks for the maximally exposed individual (MEI) for almost all of the modeled scenarios exceed a 1 in 1 million risk factor, with some scenarios modeled as presenting risks in excess of 20 in 1 million.[55]

BLM's Air Quality Modeling Analysis Predicts Significant Visibility Impacts

Haze is already a significant concern in many of the areas impacted by the proposed development. BLM's cumulative impact analysis at Class I and sensitive Class II areas shows significant visibility impacts which is concerning

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[47] *See* 055-000-003 Wyo. Code R. Section 22(b) (available online at soswy.state.wy.us/Rules/RULES/7188.pdf)
[48] BLM CD-C DEIS Table 4.5-6a p. 4-52 and AQTSD Table 3-25 p. 3-43.
[49] BLM CD-C AQTSD Table 3-27 p. 3-44.
[50] BLM CD-C DEIS Table 4.5-8 p. 4-54.
[51] BLM CD-C AQTSD p. 3-44.
[52] BLM CD-C AQTSD Table 3-27 p. 3-44.
[53] EPA, Residual Risk Report to Congress, EPA-453/R-99-001, OAQPS, RTP, NC, 1999, p. ES-11.
[54] *See* BLM CD-C AQTSD p. 3-45.
[55] BLM CD-C AQTSD Table 3-31 p. 3-47.

given that these areas are specifically afforded protections based on their scenic assets.[56] Specifically, the BLM's far-field modeling indicates that cumulative impacts will result in a 0.5 deciview (dv) change in visibility at every one of the Class I and sensitive Class II areas assessed on multiple days.[57] The DEIS states, "[t]he visibility analysis indicated a maximum of 5 days with project emissions resulting in impacts greater than the 0.5 delta deciview (Δdv) threshold at any of the Class I and sensitive Class II areas; using the 98th percentile value as a threshold, there are zero days above the 0.5 Δdv threshold."[58] However, even the 98th percentile dv change exceeds 0.5 when looking at cumulative impacts at the Bridger Wilderness Area, Fitzpatrick Wilderness Area, Popo Agie Wilderness Area, the Wind River Roadless Area and Dinosaur National Monument.[59] These cumulative visibility impacts are important to consider, even if direct project impacts are considered insignificant. It is important to recognize that a large number of existing emissions sources in the region already degrade visibility, and that the potential direct impacts from individual projects are adding to existing degradation. Even though the visibility analysis for individual projects may show visibility degradation below the threshold for concern when considered alone, when the impacts from all the existing and proposed sources are added together, the effects on visibility can be substantial.

Since NEPA and BLM's regulations require that the BLM provide for compliance with all Clean Air Act requirements the BLM must not authorize the proposed development if it will contribute to adverse impacts to visibility in Class I areas. This is necessary to meet BLM's obligation under NEPA to ensure the professional and scientific integrity of the DEIS, as well as its obligations under the Clean Air Act to not only prevent future impairment of visibility, but to also remedy existing impairment. *See* 40 C.F.R. § 1502.24, 42 U.S.C. 7491(a)(1). Specifically, under the Clean Air Act Congress declares "as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory class I Federal areas which impairment results from manmade air pollution."[60] BLM, therefore, cannot allow for any increase in emissions that would contribute to changes in visibility – even if the changes, when considered in isolation, are insignificant – at any location where significant cumulative impacts are predicted.

As provided for in under the NEPA regulations, a cumulative impact includes "past, present, and reasonably foreseeable future actions" regardless of who undertakes it or precipitates it, and can include "collectively significant actions" taking place over time. 40 C.F.R. § 1508.7. Such impacts must be included in the scope of an EIS, considered as an element of significant impacts in the EIS, and

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[56] *See* BLM CD-C DEIS Table 5.5-5 p. 5-18 and AQTSD Tables 4-44 – 4-51 pp. 4-80 – 4-82.
[57] BLM CD-C DEIS Table 5.5-5 p. 5-18.
[58] BLM CD-C DEIS ES-10.
[59] BLM CD-C DEIS Table 5.5-5 p. 5-18.
[60] CAA § 169A(a)(1), 42 U.S.C. 7491(a)(1).

fully considered as an indirect impact in the EIS due to the "induced changes" created by effects to air systems and ecosystems. *Id.* at §§ 1502.16(b), 1508.8(b), 1508.25(a)(2), (c), and 1508.27(b)(7).

Several recent modeling analyses performed by the BLM for project-specific EISs and Resource Management Plans (RMPs) showed significant visibility impacts in the Class I and sensitive Class II areas that are also of concern for the CD-C DEIS. Those analyses indicate that visibility in several Class I and sensitive Class II areas is already threatened by ongoing development, particularly oil and gas development. The Pinedale Anticline SEIS showed numerous impacts to visibility in the Bridger and Fitzpatrick Wilderness Areas, North Absaroka Wilderness Area, Popo Agie Wilderness Area and Wind River Roadless Area.[61] More recently, BLM's Colorado River Valley Field Office DRMP predicted significant visibility impacts at Mount Zirkel Wilderness Area and Dinosaur National Monument.[62] And BLM's recent White River Field Office DRMP also predicts direct and cumulative impacts at the Mount Zirkel Wilderness Area and Dinosaur National Monument.[63] The Gasco Final EIS in Utah also predicted numerous direct project and cumulative impacts at Dinosaur National Monument.[64] The Little Snake Field Office RMP in Colorado showed impacts to visibility from project sources alone using refined modeling at the Mount Zirkel Wilderness Area and Dinosaur National Monument.[65] Finally, BLM's far-field modeling analysis for the West Tavaputs Plateau oil and gas development EIS in Utah indicated that the impacts from project sources alone would result visibility impacts at Dinosaur National Monument.[66]

This DEIS must fully consider these existing visibility concerns along with the impacts of the increases in air pollutants that contribute to visibility impairment (*e.g.*, sulfates, nitrates, dust, etc.) that will come from the proposed development in the CD-C Project Area.

BLM's Air Quality Modeling Analysis Predicts Significant Ecosystem Impacts

Background total nitrogen (N) deposition at Centennial is 3.13 kilograms per hectare per year (kg/ha/yr), which significantly exceeds the critical load for N deposition of 1.5 kg/ha/yr.[67] Given this and the high frequency of westerly winds

[61] BLM Pinedale Anticline Project Area Supplemental EIS, 2008, AQTSD, Appendix E.
[62] BLM CRVFO DRMP (2011) Table 4.2.1-16 at 4-42.
[63] BLM WRFO DRMP (2012) TSD Table 4-18 at 4-35.
[64] BLM Gasco FEIS (2012) Appendix I Tables 6-1 and 7-6 pp. I-25 and I-83.
[65] BLM Little Snake Field Office Proposed RMP and Final EIS TSD (2010) at 3-23, http://www.blm.gov/co/st/en/fo/lsfo/plans/rmp_revision/rmp_docs.html.
[66] BLM, West Tavaputs Final EIS (2010), Appendix J, Air Quality Technical Report, Table 6-8, http://www.blm.gov/ut/st/en/fo/price/energy/Oil_Gas/wtp_final_eis.html.
[67] BLM CD-C DEIS Table 3.5-9. The critical loading value of 1.5 kg/ha/yr is based on wet nitrogen deposition estimates for high elevation lakes in Rocky Mountain National Park, Colorado. *See* AQTSD 4-100. Note, the portion of total nitrogen deposition that is due to wet deposition at the Centennial site is 2.6 kg/ha/yr.

carrying pollution from the project area into the Medicine Bow mountains, project deposition impacts in that Range warrant closer attention.

The DEIS reports direct project impacts on N deposition that are significant. As the DEIS notes, "[i]f current deposition of N or S is > 3 kg/ha/yr or applicable critical loads values or other scientific information is available that suggests the ecosystem is being harmed by current deposition levels, and the proposed Project's contribution to deposition is above the DAT screening levels, the impact to the ecosystem can range from moderate to major …"[68] The far-field modeling predicts that the CD-C project contribution to N deposition will exceed the deposition analysis threshold (DAT) of 0.005 kg/ha/yr at the Savage Run Wilderness Area, Rawah Wilderness Area, Mount Zirkel Wilderness Area and Dinosaur National Monument.[69] And, in fact, the contributions at the Savage Run Wilderness Area exceed the DAT by three and four times, for 2005 and 2006, respectively.[70] Concern about these results is heightened by the findings presented in the DEIS that show the CD-C CAMx model sharply underestimates wet deposition of both NO_3 and NH_4 at National Acid Deposition Program sites.[71]

Cumulative N deposition impacts are excessive at all of the areas for which results are presented in the DEIS. Specifically, total N deposition impacts exceed the 1.5 kg/ha/yr threshold at all Class I and sensitive Class II areas with impacts of up to 3.1 kg/ha/yr, 4.2 kg/ha/yr and 4.5 kg/ha/yr at the Rawah Wilderness Area, Mount Zirkel Wilderness Area and Dinosaur National Monument, respectively.[72] As discussed above, cumulative impacts must be as fully considered in an EIS as direct project impacts.

BLM fails to acknowledge these significant impacts in the DEIS. The DEIS concludes "[t]here would be no nitrogen and sulfur deposition impacts that exceed BLM critical load values at any Class I or sensitive Class II area."[73] BLM must include an enforceable mitigation strategy to address the modeled significant N deposition impacts in order to ensure that there will be no significant ecological impacts from the proposed development. Specifically, BLM must assess whether the N deposition impacts shown in the DEIS will result in adverse impacts to biodiversity, including aquatic organisms, and ultimately to trout which are a valued resource in the region. If N deposition causes acidification at a level that results in impacts to trout, the resulting deterioration in aquatic resources has the potential to not only reduce biodiversity but to adversely impact the economic benefits that trout fishing brings to the area.

Trout Unlimited reports the following indicators of the importance of fishing to the

[68] BLM CD-C AQTSD p. 4-100.
[69] BLM CD-C AQTSD Table 4-80 p. 4-100.
[70] BLM CD-C AQTSD Table 4-80 p. 4-100.
[71] BLM CD-C AQTSD Figures A5-5h, A5-5i, A5-6h and A5-6i.
[72] BLM CD-C DEIS Table 5.5-6 p. 5-18; AQTSD Table 4-84 p. 4-102.
[73] BLM CD-C DEIS ES-10.

state economy:

> Over 4 million tourists visit Wyoming annually and contribute nearly $1.9 billion to the state's economy. Fishing, river rafting and hunting are among the top seven outdoor activities visitors participate in most frequently during their stay in Wyoming [fishing is tied with rafting for the third most frequent activity].
>
> Nearly one-third of Wyoming's residents are anglers who spend over 90 percent of their fishing days in Wyoming.
>
> Anglers spent approximately $423 million in Wyoming in 2002. The sportfishing industry creates 3,500 jobs in the state.
>
> Healthy fisheries that support thriving fish populations on rivers are essential to keeping anglers, and their dollars, in Wyoming.[74]

The U.S. Fish and Wildlife recovery plan for the cutthroat trout cites reduced pH as a concern for habitats and fish population viability, in general, is reportedly reduced at pH levels below 6.[75] According to research on critical loads in the Colorado Front Range, "acidification of surface waters and resulting decrease in pH can cause changes in the aquatic resources of high-elevation catchments" and, more specifically, "native fish species, such as cutthroat trout and rainbow trout, have known sensitivity to acidic waters depending on the life stage exposed to acidic episodes."[76] BLM should identify critical loads for acidification likely to impact trout. Recent work mapping critical loads in the region indicate the Medicine Bow Mountains have some of the highest N deposition levels in the intermountain west.[77] All of this points to a critical need for the BLM to more closely assess the N deposition impacts, in particular, in the wilderness areas in the Medicine Bow where trout streams are considered a critical resource (*i.e.*, Huston Park, Encampment River, Savage Run and Platte River Wilderness Areas).

BLM's Air Quality Modeling Analysis Does Not Assure the Prevention of Significant Deterioration (PSD) Air Quality Requirements are Met

[74] Trout Unlimited, "The Economic Value of Healthy Fisheries in Wyoming", January 2005.

[75] *See* U.S. Fish and Wildlife Service, Greenback Cutthroat Trout Recovery Plan, Denver, Colorado (1998) at 12-13 and Baker, J. P., D. P. Bernard, and S. W. Christensen. 1990. Biological effects of changes in surface water acid-base chemistry. NAPAP Report 13.

[76] Mark Williams. 2000. Critical loads for inorganic nitrogen deposition in the Colorado Front Range, USA, available at http://snobear.colorado.edu/Markw/Research/critical_loads.pdf.

[77] L. Nanus et al. 2012. Mapping critical loads of nitrogen deposition for aquatic ecosystems in the Rocky Mountains, USA. Environmental Pollution 166: 125-135, Figure 2.

BLM has not properly analyzed whether the proposed development will prevent significant deterioration (PSD) of air quality, as required by the Clean Air Act. BLM must complete an analysis to determine how much of the incremental amount of air pollution allowed in clean air areas (*i.e.*, PSD increment) has already been consumed in the affected area and how much additional increment consumption will occur due to the proposed development. Without this analysis, the BLM is not adequately ensuring that air quality will not deteriorate more than allowed under the CAA.

The PSD increment analysis presented in the DEIS is fundamentally flawed and incomplete. Class II PSD increments apply and need to be examined throughout the domain, not just in "sensitive" Class II areas as described in the DEIS.[78] Specifically, the CAMx Particulate Matter Source Apportionment Technology (PSAT) analysis only compares the incremental contributions of pollutants that are attributed to CD-C project sources to the Class I and Class II PSD increments in Class I areas and "sensitive" Class II areas.[79] Yet Class II PSD increments apply throughout the modeling domain, except where areas have been designated nonattainment or Class I. BLM must assess and disclose the maximum project impacts on Class II increments throughout the project impact area, wherever they occur. Presenting increment consumption just for sensitive Class II areas is highly misleading.

However, even without the proper analysis (one that looks at the impact of *all* increment consuming and increment expanding sources throughout the project impact area – including project sources and other increment-affecting sources), the BLM's analysis shows that modeled concentrations from all sources exceed PSD increments. Specifically, modeled contributions from "all sources" in the mid-field analysis consume more than the available 24-hour Class II PSD increments for PM_{10} and $PM_{2.5}$ and consume nearly all of the available annual $PM_{2.5}$ Class II PSD increment and a substantial portion of the available annual NO_2 Class II PSD increment.[80] It does not appear that the DEIS presents a comprehensive analysis of the impacts from project and regional sources. Concentrations are not the totals "from all sources" as stated in the DEIS.[81] If the intent is to show the combined effect of the project and regional sources, the domain for assessing regional increment consumption must be expanded to include all sources that impact the same area impacted by the project development. Mid-field modeled contributions from CD-C sources alone consume a significant fraction of Class II PSD increments for NO_2, $PM_{2.5}$ and PM_{10}.[82] And the far-field modeling results suggest the CD-C project alone would consume 7 $\mu g/m^3$ of the available annual average NO_2 increment of 25 $\mu g/m^3$

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[78] *See, e.g.,* BLM CD-C DEIS p. 5-16, Section 5.5.2.
[79] BLM CD-C AQTSD pp. 4-17 – 4-19, Tables 4-6 – 4-11.
[80] BLM CD-C DEIS Table 4.5-10 p. 4-56.
[81] *See* BLM CD-C DEIS Table 4.5-10 p. 4-56.
[82] BLM CD-C DEIS Table 4.5-10 p. 4-56.

and 9 µg/m^3 of the available 24-hour average PM_{10} increment of 30 µg/m^3, which would represent substantial consumption of the corresponding Class II increments for each of these pollutants.[83] These and other Class II PSD increments may, therefore, be exceeded when considering all other increment consuming and increment expanding sources in the area that impact the same area impacted by the proposed development. $PM_{2.5}$, PM_{10} and NO_2 impacts must be further evaluated with a proper increment consumption analysis – one that includes all increment-affecting sources – and compared to the applicable annual average and 24-hour average increments for these pollutants throughout the impacted area.

According to the DEIS:

> Comparisons of CD-C project impacts to the PSD Class I and II increments are for informational purposes only and are intended to evaluate a threshold of concern. They do not represent a regulatory PSD Increment Consumption Analysis, which would be completed as necessary during the New Source Review permitting process by the State of Wyoming.[84]

However, BLM is required under NEPA to analyze and disclose all significant air quality impacts, regardless of whether another agency might address an adverse environmental impact in the future (*e.g.*, the State of Wyoming). And BLM's regulations require *it* to "require compliance" with Clean Air Act standards. 43 C.F.R. § 2920.7(b)(3). BLM is required under NEPA to satisfy all Clean Air Act requirements, and thus the BLM cannot authorize an action unless it has ensured that the PSD increments will not be exceeded. The PSD increments are separate ambient air quality standards not to be exceeded, as set out in §163 of the Clean Air Act, that apply in addition to the national ambient air quality standards in clean air areas. Reliance on the State's permitting process cannot be substituted for the BLM's obligations under NEPA. BLM must consider the PSD increments as important and legally binding CAA requirements and it must provide for compliance with these requirements in the DEIS. Since emissions from major stationary sources which commenced construction or modification after the applicable "major source baseline date" and emissions increases from minor, area and mobile sources that occurred after the relevant "minor source baseline date" affect the allowable increment, it is impossible to tell how much of the modeled cumulative concentrations consume increment.[85] The correct way to determine compliance with the PSD increments is to complete a modeling analysis of all increment consuming and increment expanding sources that

[83] BLM CD-C AQTSD p. 4-21; p. 4-31.
[84] BLM CD-C DEIS p. 3-56.
[85] The major source baseline dates are January 6, 1975 for SO_2 and PM_{10} and February 8, 1988 for NO_2 (40 CFR 52.21(b)(14)(i)). The minor source baseline dates in Wyoming differ by pollutant and by [baseline] area and were triggered on the date that a complete PSD permit application was received by the State. See definitions of "major source baseline date", "minor source baseline date" and "baseline area" in 40 CFR 52.21(b)(14)(i), 52.21(b)(14)(ii) and 52.21(b)(15).

impact the same area impacted by the proposed development. BLM is required to "provide for compliance with" all CAA requirements, and cannot authorize an action that would violate the PSD increments, which are a CAA requirement under Section 163.

III. BLM's Air Quality Analysis Likely Underestimates Air Quality Impacts

BLM's own modeling, as described in the previous section, shows numerous adverse air quality impacts. However, the modeling, including the inputs and the ways in which the BLM performed the modeling analyses, are not adequate to fully assess the potential impacts from the proposed development on an area already impacted by industrial growth. The result of the deficiencies in the modeling is that the adverse air quality impacts from the development are likely worse than what is disclosed in the DEIS. The areas of greatest concern are discussed in more detail below.

The Ozone Analysis for the DEIS Underestimates Impacts and Fails to Address Wintertime Ozone Impacts

The DEIS indicates that the CD-C modeling for 2005 generally has an underestimation bias for the 4 km modeling domain.[86] The bias is highest for the sites currently observed to have the highest ozone concentrations – those in Sublette County. The bias is also highest for the winter quarters, Q1 and Q4, but is also present in Q2 and Q3. The bias is most pronounced with the highest cutoff level (60 ppb), and is outside EPA guidelines for all 4 quarters with the 60 ppb cutoff.[87] The DEIS further indicates the bias is somewhat lower but still substantial for 2006.[88] Time series plots included in the DEIS further illustrate the underestimation bias for most of the sites in the 4 km modeling domain.[89] Wamsutter and OCI represent exceptions, either displaying overestimation tendencies or little bias.

Overall, the modeling presented in the DEIS does not reflect a conservative assessment of ozone impacts to the region from the proposed action. Therefore, ozone impacts may be even greater than what is presented in the DEIS. In addition to the underestimate bias reported in the DEIS there are several other factors that contribute to a less conservative analysis in the DEIS. Fundamentally, CAMx ozone modeling is not designed to be conservative (*i.e.*, not tending toward worst case assumptions). Additionally, use of 2005-2006 meteorology data likely does not represent sufficiently conservative conditions. In

[86] BLM CD-C AQTSD Appendix A, Table A4-1a – A4-1c.
[87] EPA's guidelines: ±15% (bias) and ±35% (error).
[88] BLM CD-C AQTSD Appendix A, Table A4-1d – A4-af.
[89] BLM CD-C AQTSD Appendix A, Figure A4-1 and A4-2

2008, ozone concentrations in the area were higher than in 2006, most likely due to the presence of meteorological conditions that enhanced ozone formation as well as higher levels of emissions. Therefore, the use of 2005-2006 data would result in an underestimate in predicted ozone concentrations for cases when meteorology and emissions are similar to 2008 conditions. But probably most significant, the DEIS does not account for wintertime ozone formation. The absence of a wintertime ozone analysis is a major limitation of the DEIS.

According to the DEIS, the Wyoming Department of Environmental Quality's Air Quality Division (WDEQ-AQD) "instructed the CD-C modeling team to not address the wintertime ozone exceedances as they are a research topic so should not be part of NEPA and instead focus on the summer ozone time periods."[90] Yet modeling results for wintertime ozone concentrations are included in Appendix A of the AQTSD as part of the base case modeling performance evaluation. The DEIS includes model performance evaluations for the 2005 and 2006 base case scenarios based on CD-C project modeling and on previously-conducted modeling for the Hiawatha Regional Energy Development Project EIS (Hiawatha). The results of the base case modeling evaluations suggest it is not unreasonable or inappropriate to include wintertime modeling results in the DEIS analysis. Specifically, model results are presented in the DEIS and compared with year-round monitoring data at the Boulder, Jonah, Pinedale, Centennial, Daniel, Wamsutter and OCI monitors.[91] In general, the modeling results appear to underestimate winter ozone concentrations, but not in all cases. According to the DEIS, "[a]t the Boulder monitor for Quarter 1 (Q1) in 2005 (Figure A4-3a, top) neither base case simulation [CD-C and Hiawatha] reproduces the observed high winter ozone concentrations."[92] The DEIS further reports that there is a tendency to underestimate ozone concentrations during Q1 in 2005 at the Boulder location.[93] However, the DEIS states that "[w]ith the exception of a few observed high winter ozone events in January and February 2005, the two models [CD-C and Hiawatha] do a much better job of reproducing the winter (Q1 and Q4) observed 8-hour ozone concentrations at the Jonah monitor (Figure A4-3b) than is seen at the Boulder monitor (Figure A4-3a)."[94] And "[d]uring 2005 Q4, both models tend to underestimate the high observed ozone days at Jonah, with the CD-C base case generally higher and closer to the observed values than the Hiawatha base case."[95] Closer to the project area, the performance of the CD-C and Hiawatha modeling appears to be reasonably good:

> At Wamsutter both models perform reasonable well in Q3 but have an overestimation bias in Q4. With the exception of a few days, the two base

[90] BLM CD-C AQTSD Appendix A at A-38.
[91] Note, the Wamsutter and OCI monitors did not come online until 2006. Data are available at Wamsutter from all four quarters of 2006 and at OCI from quarters 2 though 4.
[92] BLM CD-C AQTSD Appendix A at A-68.
[93] BLM CD-C AQTSD Appendix A at A-68.
[94] BLM CD-C AQTSD Appendix A at A-68.
[95] BLM CD-C AQTSD Appendix A at A-68.

case simulations reproduce the observed ozone at OCI reasonably well.[96]

Certainly the results of the performance evaluation indicate that there is a tendency towards underestimation, especially at observed maximum concentrations in winter. But the BLM should absolutely consider the modeled wintertime ozone concentrations from the proposed action and should fully disclose the results of such modeling in the DEIS. Surely, if modeled wintertime ozone concentrations are shown to be a problem and the performance evaluation for the modeling indicates that modeled results likely underestimate impacts in winter then the BLM has an obligation under NEPA to reduce emissions from the proposed development that contribute to those modeled adverse impacts. At a minimum, the BLM must be able to ensure there will be no significant impacts to wintertime ozone levels based on the modeling, as evaluated (with an underestimation bias), in the DEIS. As shown by the ozone nonattainment area in Sublette County and other counties, and the extremely high wintertime ozone levels in that nearby area, wintertime ozone has simply become far too big of an issue, of tremendous public interest and concern, to be ignored in this EIS.

The fact that the state has "instructed" the BLM to not include wintertime ozone modeling in the DEIS does not excuse the BLM from fulfilling its obligations under NEPA to conduct such an analysis if one is reasonable. BLM's decision to not include winter ozone modeling is not supported by evidence that the BLM either cannot obtain the needed information without exorbitant cost or cannot present a credible scientific estimation based on methods generally accepted in the scientific community.[97] According to NEPA regulation, if an estimation of reasonably foreseeable significant adverse impacts cannot be obtained because, among other things, the means to obtain it are "not known", BLM has an obligation to include an evaluation "based upon theoretical approaches or research methods generally accepted in the scientific community" provided that "the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason."[98] These methods of dealing with incomplete information are required under NEPA and must be thoroughly exercised before drawing the conclusion that a wintertime ozone analysis cannot be included in the DEIS. *See* 40 C.F.R. § 1502.22. BLM has, in fact, modeled wintertime ozone concentrations for the base case scenarios using the latest modeling techniques and has evaluated the performance of the model with currently available data and according to EPA policy and guidance. BLM therefore must offer a more convincing argument for why use of the CAMx model, while clearly not yet ideal for predicting wintertime ozone concentrations, is more likely to be considered as pure conjecture rather than as the best available tool based on credible science.

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[96] BLM CD-C AQTSD Appendix A at A-68.
[97] *See* 40 C.F.R. § 1502.22
[98] 40 C.F.R. § 1502.22 Incomplete or unavailable information

Air quality studies in the Uinta Basin in Utah are ongoing and targeted at finding the most effective mitigation strategies for the wintertime ozone problems occurring in that area. Currently, the studies are focused on evaluating the sensitivity of winter ozone concentrations to VOC and NO_x emissions. The Uinta Basin 2010-2011 wintertime ozone study concluded that closer proximity to oil and gas wells resulted in higher ozone concentrations.[99] The parties involved in the air quality studies in the Uinta Basin are in the process of developing a conceptual model of how winter ozone is formed and recognize the need for a validated photochemical modeling analysis of the basin for simulating winter ozone formation in order to fully understand and quantify the effectiveness of mitigation strategies.[100] BLM should monitor the findings of these studies and apply what is learned in Utah to Wyoming, where appropriate.

In addition to these issues with the model performance, ozone impacts may be underestimated due to underestimated emissions inputs. Based on findings from a recent study of VOC emissions from oil and gas sources in the Colorado Front Range, emission inventories may under-predict fugitive emissions from oil and gas sources.[101] The Colorado Front Range study concludes that fugitive emissions in Weld County in 2008 were likely underestimated by a factor of two.[102] It is also therefore likely that VOC emissions used in inventories during that same time period also underestimate emissions (since they are based on similar estimation techniques). The CD-C analysis includes inventories from years 2005-2006 (base case inventories) and 2008 (baseline inventory). Therefore, the potential for underestimated fugitive VOC emissions in the CD-C analysis is likely since the ozone modeling was based on inventory data from a similar time period and, therefore, since the inventory data may significantly underestimate VOC emissions from that time period, the ozone concentrations predicted for the CD-C analysis likely also underestimate impacts.

Modeled ozone results presented in the DEIS must be evaluated with care given the fact that: (1) the model performance evaluation shows underestimation bias, with the highest bias occurring at sites currently observing the highest ozone levels; (2) CAMx is not designed to be a conservative model; (3) base case meteorology does not represent conservative conditions; (4) modeling does not account for wintertime ozone formation; and (5) the model inventory may significantly underestimate fugitive VOC emissions. Given the likelihood that

[99] Energy Dynamics Laboratory, Utah State University Research Foundation, Final Report: Uinta Basin Winter Ozone and Air Quality Study December 2010-March 2011, EDL/11-039, June 14, 2011, p. 97.

[100] 2012 Uintah Basin Winter Ozone & Air Quality Study – Summary of Interim Findings, Ongoing Analyses, Additional Recommended Reasearch, and Possible Mitigation Strategies, Prepared by researchers and air quality managers at USU/EDL, Alpine Geophysics, ENVIRON, UDEQ and EPA, August 7, 2012.

[101] Pétron, G., et al. (2012), Hydrocarbon emissions characterization in the Colorado Front Range: A pilot study, J. Geophys. Res., 117, D04304, doi:10.1029/2011JD016360.

[102] *Id*. at 18.

modeled concentrations may greatly underestimate ozone impacts and the fact that monitored ozone concentrations already exceed 60 ppb in the area, the DEIS must contain enforceable VOC and NO_x mitigation measures that ensure modeled emissions from the proposed development do not contribute to *any* exceedances of the NAAQS at any modeled receptors throughout the region. In the NEPA context, any modeled exceedance of the ozone NAAQS should be considered a significant impact for the DEIS, regardless of whether there are three years worth of available monitoring data for use in determining the area's official attainment status under the CAA. And, as discussed earlier, since concentrations below the current and likely soon to be lowered NAAQS are known to pose health threats, the BLM should consider lower concentrations as potentially significant impacts. BLM has a basic obligation to "provide full and fair discussion of significant environmental impacts", where in evaluating the significance of the impact, the responsible official must consider "[t]he degree to which the proposed action affects public health or safety." See 40 C.F.R. §§ 1502.1 and 1508.27(b)(2), (b)(10).

In Wyoming, the BLM is already partnering with cooperating agencies, operators, the environmental community and the public to implement an adaptive environmental management process. This process of: (1) including mechanisms for continual monitoring and assessment of impacts through periodic review of mitigation measure effectiveness; and (2) validation of predictive models with field observations and impact monitoring and making necessary adjustments to mitigation measures, as needed, is critical to attainment of the ozone NAAQS in the region. These collaborative efforts are demonstrated by the DEQ Upper Green River Basin Air Quality Citizens Advisory Task Force, of which BLM was a member, which was charged with making recommendations for reducing ozone levels in the nonattainment area (which it successfully did), and which is an important component of DEQ's efforts to participate in the EPA Ozone Advance program.

In addition to the human health effects, ozone pollution can cause adverse effects to the physical environment. Ozone is absorbed by plants and can cause leaf discoloration, reduced photosynthesis, and reduced growth as well as make plants more susceptible to disease, pests and environmental stresses.[103] Ozone effects on trees are thought to accumulate over time such that whole forests or ecosystems can be affected. Many plant species have been specifically identified by the Federal Land Managers as being sensitive to ozone pollution in the Class I areas impacted by the proposed development, including Ponderosa Pine, Subalpine fir, Boxelder, Serviceberry, Sagebrush, Hybrid poplar, Trembling aspen, Chockcherry, Ninebark, Thimbleberry, Squawberry and Huckleberry in

[103] As discussed in U.S. National Park Service, Air Quality in Our National Parks, 2002, Chapter 2.

the Bridger and Fitzpatrick Wilderness Areas.[104] Ozone also contributes to climate change. According to the Intergovernmental Panel on Climate Change (IPCC), ozone is the third-largest contributor to global climate change after carbon dioxide and methane.[105] BLM should include an assessment of the impacts to the physical environment from ozone concentrations in the impacted area.

The Approach Used to Determine Short Term NO_2 and $PM_{2.5}$ Impacts is Flawed

In determining 1-hour NO_2 concentrations for comparison with the NAAQS, an average is taken over three years with drilling occurring in only two of them.[106] The three-year averaging period for nonattainment determinations is meant to avoid assigning nonattainment status based on unusual meteorology. Here, instead, averaging in one-year with reduced emissions masks the actual implications of the activities, it is not a method that accounts for unusual meteorology. The 1-hour NO_2 standard is a short term standard, and high levels in any year would be a concern. The fact that drilling will not likely occur for three consecutive years at the same location, as indicated in the DEIS, is irrelevant when determining short-term impacts. Maximum emission drilling scenarios should be modeled for all three years of meteorological data and the average of those modeled concentrations should be combined with the representative background concentration and compared with the standard. The details reported in the AQTSD (in Appendix L) indicate that the 8th highest daily maximum 1-hour NO_2 concentrations would exceed the standard for most of the scenarios considered during years when drilling emissions were included in the modeling. For example, even with Tier 4 engines, the modeled case with a drill rig and four wells in production plus 5 surrounding wells in production would have 8th highest daily maximum concentrations of 136 and 133 µg/m^3 in the two modeled years when the rig is operating, without factoring in background concentrations.[107] Adding in the assumed background concentration of 75 µg/m^3 yields concentrations of 211 and 208 µg/m^3, which exceeds the standard (NAAQS) by a large margin. It is only by inappropriately averaging in concentrations from a year without the drill rig operating that the predicted concentration falls below the level of the standard, as claimed in the DEIS.[108] BLM must correct this flawed methodology for the final EIS and determine the short-term NO_2 impacts from

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[104] See Appendix 3.A of the Federal Land Manager's Air Quality Related Values Workgroup Phase I Report, December 2000 (FLAG guidance).

[105] Piers Forster & Venkatachalam Ramaswamy, *et al., Changes in Atmospheric Constituents and in Radiative Forcing*, in CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS. CONTRIBUTION OF WORKING GROUP I TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 152 (Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M.Tignor and H.L. Miller (eds, 2007), *available at* hhttp://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-chapter2.pdf.

[106] BLM CD-C DEIS p. 4-46 and AQTSD p. 3-9.

[107] BLM CD-C AQTSD Appendix L Table L.1-2a.

[108] BLM CD-C AQTSD Tabl3 3-10 p. 3-28.

drilling operations by including drilling emissions in each of the three years of meteorological data modeled.

As with the approach for the 1-hour NO_2 standard, the approach used to calculate 24-hour $PM_{2.5}$ levels for comparison with the NAAQS is flawed. Years with reduced emissions should not be averaged together with years with full emissions in determining short-term impacts. A three-year averaging period is meant to dampen effects from unusual meteorology, not to allow for the use of long-term averages in emissions to determine short-term impacts. The DEIS presents a three year average with two of the years representing reduced emissions to mask the actual impacts from the activities that generate the highest short-term impacts. The 24-hour $PM_{2.5}$ standard is a short-term standard and high levels in any year would be a concern. The fact that high levels of $PM_{2.5}$ emissions (*e.g.*, due to construction activities) will not likely occur for three consecutive years at the same location is irrelevant when determining short-term impacts. Maximum emission scenarios should be modeled for each of the three years of meteorological data and the average of those modeled concentrations should be combined with the representative background concentration and compared with the standard. The modeling completed for the DEIS shows that with 4 single-well pads in construction, the maximum 24-hour average $PM_{2.5}$ concentration would be 92 $\mu g/m^3$ at a distance of 100 meters and 69.4 $\mu g/m^3$ at 250 meters.[109] When a background concentration of 9.2 $\mu g/m^3$ is added in, the total concentrations would be 101 and 79 $\mu g/m^3$, whereas the standard is set at a level of 35 $\mu g/m^3$. It is only by inappropriately averaging in concentrations from two years without the construction activities that the predicted concentrations fall to the levels described in the DEIS.[110] BLM must correct this flawed methodology for the final EIS and determine the short-term $PM_{2.5}$ impacts from construction by including maximum emissions scenarios in each of the three years of meteorological data modeled.

In addition to inappropriately averaging NO_2 and $PM_{2.5}$ impacts for comparison with the NAAQS, the DEIS also uses a faulty method of pairing data to assess impacts. While there appears to be no discussion of the actual technique used to pair data in the modeling analysis, it is assumed that BLM is taking the highest concentration in one modeled year and averaging the highest concentration that occurred *at that same location* in the other two model years to arrive at a 3-year average concentration. The DEIS presents modeled results labeled as “Paired in Location” and “Unpaired in Location” and the 3-year average concentrations used in the DEIS for comparison with the NAAQS are based on data paired in location.[111] This method of pairing data likely underestimates impacts by ignoring other locations in the other two model years with potentially higher predicted concentrations. And, again, since using an average over three different years of

[109] BLM CD-C AQTSD Appendix L Table L.2-1a.
[110] BLM CD-C AQTSD Table 3-19.
[111] *See, e.g.,* BLM CD-C AQTSD Appendix L.

meteorology data is meant to average out the meteorological variations there is no justification for only looking at one location over the three years of meteorological data used when determining compliance with a short-term standard. The DEIS should be reporting what the short-term impacts are from emissions sources (regardless of where they occur) when considering a 3-year meteorological record, not what the impacts are over the course of three years of activity at one location. And, in fact, a 3-year average concentration based on the unpaired modeling results presented in the DEIS would be higher in all cases.[112]

Fundamentally, the modeling for the DEIS should be used as a tool to ensure that adverse impacts *will not occur in the future*, not simply to determine whether or not an adverse impact occurred over the period of time modeled. Therefore, the more protective approach would be to take the 3-year average of unpaired model results based on the maximum emissions scenario modeled over a three year meteorology record. Given the fact that the 1-hour average NO_2 and 24-hour average $PM_{2.5}$ modeled impacts are already predicted to exceed the standard in several modeled scenarios, BLM must ensure that the modeling is not under-predicting impacts.

The NO_2 Background Concentration Used in the DEIS is Not A Representative Background Concentration

EPA has issued recent guidance on combining modeled results and monitored background concentrations to determine compliance with the 1-hour NO_2 NAAQS and the BLM must adhere to this guidance.[113] Specifically, when determining compliance with the 1-hour NO_2 NAAQS, the BLM should add the overall highest (not 98th percentile) hourly representative background concentration to the modeled design value that is based on the form of the standard (*i.e.*, the 98th percentile of the annual distribution of daily maximum 1-hour concentrations averaged across the number of years modeled). The background 1-hour NO_2 concentration in the DEIS is based on a three year average from 2008-2010 of daily maximum 98th percentile concentrations.[114] The DEIS analysis must be based on a representative background concentration for NO_2 according to EPA guidance – one that is based on the overall maximum 1-hour NO_2 concentration from a representative year (*i.e.*, not the 98th percentile concentration averaged over 3 years). This representative background concentration should then be added to the modeled 98th percentile NO_2 concentration averaged over the years modeled and compared with the NAAQS in determining whether the proposed development will result in significant NO_2 impacts.

[112] BLM CD-C AQTSD Appendix L.
[113] EPA MEMO, "Applicability of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard", June 28, 2010 at 18.
[114] BLM CD-C DEIS Table 3.5-8 p. 3-63.

$PM_{2.5}$ Background Concentrations Used in the DEIS Are Not Representative of Current Background Levels in the Area

The 24-hour $PM_{2.5}$ background concentrations presented in the DEIS are from Cheyenne and are based on a three year average (2008-2010) of the daily maximum 98th percentile 24-hour concentrations.[115] The 24-hour average $PM_{2.5}$ concentration is reported as 9.2 µg/m^3. $PM_{2.5}$ data from other monitoring locations closer to the project area indicate that these data from Cheyenne may not be reflective of potentially higher concentration conditions that have occurred in more recent years and closer to the proposed development. Specifically, exceedances of the 24-hour $PM_{2.5}$ standard were recorded in 2012 at the monitor in Rock Springs, Wyoming, just west of the project area and in 2009 at the monitor in Lander, Wyoming, just north and west of the project area.[116] (Both monitors are far closer to the project area than the monitor in Cheyenne). And the 98th percentile 24-hour average concentrations at these monitors were close to exceeding the 24-hour NAAQS in those years.[117] The 98th percentile 24-hour $PM_{2.5}$ concentration in 2012 in Cheyenne was 18.8 µg/m^3, over twice what is presented as a representative background concentration in the DEIS.[118]

According to recent guidance from EPA, demonstrating compliance with the 24-hour $PM_{2.5}$ NAAQS requires the 98th percentile monitored background value be added to the average of the 1st highest modeled 24-hour average concentration over the five meteorological years modeled.[119] Therefore, a three-year average of the 98th percentile 24-hour monitored concentrations, as presented in the DEIS, likely underestimates background concentrations for $PM_{2.5}$. Background concentrations for $PM_{2.5}$ should be based on the highest 98th percentile 24-hour concentration from a single year. The highest 98th percentile values at the Rock Springs and Lander monitors are 32.6 µg/m^3 (2012) and 34.9 µg/m^3 (2009), respectively.

The DEIS Fails to Consider Secondary Formation of $PM_{2.5}$

115 BLM CD-C DEIS Table 3.5-8 at 3-63.

116 EPA AirData, max 24-hour $PM_{2.5}$ concentrations: 37.6 µg/m^3 (Rock Springs, 2012, ID 56-037-0007) and 37.8 µg/m^3 (Lander, 2009, ID 56-013-1003) compared with the NAAQS of 35 µg/m^3. Note, both of these concentrations are reported under Local Conditions.

117 EPA AirData, 98th percentile $PM_{2.5}$ concentrationa: 32.6 µg/m^3 (Rock Springs, 2012, ID 56-037-0007) and 34.9 µg/m^3 (Lander, 2009, ID 56-013-1003) compared with the NAAQS of 35 µg/m^3

118 EPA AirData, http://www.epa.gov/airdata

119 *See* February 26, 2010 MEMO from Tyler Fox, EPA Air Quality Modeling Group to Erik Snyder, Lead Regional Modeler EPA Region 6, Regarding "Model Clearinghouse Review of Modeling Procedures for Demonstrating Compliance with $PM_{2.5}$ NAAQS", http://www.epa.gov/ttn/scram/guidance/mch/new_mch/MCmemo_Region6_PM25_NAAQS_Compliance.pdf.

The $PM_{2.5}$ modeling conducted for the DEIS only considers primary $PM_{2.5}$ (directly emitted from combustion point sources and from fugitive sources). Emissions of NO_x, VOCs, SO_2 and ammonia can form into $PM_{2.5}$, after being emitted into the atmosphere, and this could potentially be a significant component of ambient $PM_{2.5}$ concentrations. Estimates of $PM_{2.5}$ formation from these precursors should also be included in the BLM's modeling analyses.

The fraction of $PM_{2.5}$ concentrations in the ambient air that is due to the secondary formation of $PM_{2.5}$ (*e.g.*, sulfates and nitrates), as opposed to directly emitted [primary] $PM_{2.5}$ (*e.g.*, as a product of combustion) is dependent on many factors. However, the presence of strong temperature inversions that limit dispersion and provide conditions that contribute to the formation of secondary $PM_{2.5}$ in the atmosphere can increase secondary $PM_{2.5}$ formation. Due to the potential for wintertime temperature inversions in the region, the BLM must seriously consider the contribution from secondary $PM_{2.5}$ to total $PM_{2.5}$ concentrations in the area. All of the sources of the primary pollutants that contribute to secondary $PM_{2.5}$ formation—*e.g.*, NO_x, SO_x, VOC and ammonia—from sources in the area should be accounted for in an assessment of $PM_{2.5}$ impacts.

The CAMx model used in the far-field modeling analysis is one tool available to assess secondary $PM_{2.5}$ formation. CAMx has source apportionment capabilities and can assess a wide variety of inert and chemically reactive pollutants, including inorganic and organic $PM_{2.5}$ and PM_{10}. In addition, EPA's Support Center for Regulatory Atmospheric Modeling (SCRAM) provides various resources for modeling the impacts of secondary $PM_{2.5}$. For example, EPA's recently-developed model based on the Community Multi-scale Air Quality (CMAQ) model in support of the development of the $PM_{2.5}$ NAAQS has been shown to "reproduce the results from an individual modeling simulation with little bias or error" and "provides a wide breadth of model outputs, which can be used to develop emissions control scenarios".[120] The Regional Modeling System for Aerosols and Deposition (REMSAD) can also model concentrations of both inert and chemically reactive pollutants on a regional scale, "including those processes relevant to regional haze and particulate matter".[121] These are just some examples of current models, identified by EPA, with the capability to assess secondary $PM_{2.5}$ impacts. With adequate performance testing (using existing regional monitoring data to ensure accuracy) these models could be used in the NEPA context. An alternative to these grid models would be for the BLM, in cooperation with EPA, to develop a screening point source model—like CALPUFF—to look at near-field $PM_{2.5}$ primary and secondary impacts.

It is important that the BLM use the available tools to fully assess the impact of

[120] *See* February 2006 Technical Support Document for the Proposed PM NAAQS Rule (available at: http://www.epa.gov/scram001/reports/pmnaaqs_tsd_rsm_all_021606.pdf).
[121] *See* EPA, http://www.epa.gov/scram001/photochemicalindex.htm.

emissions from this development project that contribute to secondary $PM_{2.5}$ formation. Resulting $PM_{2.5}$ concentrations will be higher when considering the additional impacts from secondary $PM_{2.5}$. Considering the already high $PM_{2.5}$ concentrations in the area (*e.g.*, background concentrations from monitors in the area that have recorded exceedances of the 24-hour average $PM_{2.5}$ NAAQS[122]) the secondary $PM_{2.5}$ impacts are critical to understanding the best way to mitigate health impacts from fine particle pollution from the proposed development.

The Hazardous Air Pollutant Analysis in the DEIS is not Sufficient to Assess All of the Potential Health Impacts from the Proposed Development

The DEIS presents unacceptable health risks associated with hazardous air pollutant impacts from the proposed development. These risks are especially concerning considering that: (1) higher exposure levels could occur when new development or production activities occur in combination with existing wells; (2) secondary HAPs including secondary formaldehyde were not considered; and (3) important HAP impacts were ignored.

First, the modeled scenarios for the near-field DEIS analyze impacts from new well development only.[123] Near-field modeling scenarios should include project activities in combination with existing production activities. Since the latter are not as well controlled as new production activities would be, consideration needs to be given to what the impacts would be if new wells are located in close proximity to existing ones. This is especially appropriate since as the DEIS acknowledges, there are 4,400 existing wells in the project area, this project will in essence be an infill development, and therefore it is highly likely many new wells be drilled in close proximity to existing wells. This is especially true for HAP impacts since HAP emissions are much higher from existing wells.[124]

Second, formaldehyde emissions are likely underestimated. Secondary production of formaldehyde from chemical reactions of precursor emissions should be considered in addition to the concentrations from primary formaldehyde emissions. Also, the inventory for flaring is highly uncertain and likely underestimates emissions from this source, which is heavily relied upon as a control measure in the DEIS. Control effectiveness of flares is especially uncertain in situations like the proposed development where flares are installed at removed sites without continuous surveillance. Production flaring accounts for over 90% of all formaldehyde emissions from new wells so any uncertainty in emissions from this source category could have a significant impact on the ability to safely predict formaldehyde impacts.

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[122] EPA AirData, Rock Springs (ID 56-037-0007) and Lander (56-013-1003) both recorded exceedances of the 24-hour $PM_{2.5}$ NAAQS.
[123] BLM CD-C DEIS p. 4-49 and AQTSD pp. 3-8 – 3-10.
[124] *See* BLM CD-C AQTSD Appendix H pp. H-90 – H-95 compared with pp. H-192 – H-197.

Finally, near-field modeling should be expanded to include the full suite of Mobile Source Air Toxics (MSAT), methanol, chlorinated solvents used on site, carbonyl compounds used in flares and diesel particulate matter and should include construction activities as well as production.[125] BLM has, in fact, completed a more comprehensive analysis of HAPs in other recent NEPA actions which resulted in significant impacts from HAPs that are not included in the DEIS for the CD-C project. Specifically, the Gasco EIS in Utah evaluated short-term and long-term impacts from numerous HAPs, including methanol, chlorinated solvents and acrolein.[126] The Gasco EIS analysis found elevated cancer risks for acetaldehyde, 1,3-butadiene, and ethylene dibromide, none of which are included in the DEIS for the CD-C project.[127] The Gasco EIS also reported acrolein emissions that exceeded the acute Reference Exposure Level (REL) and the Reference Concentration for Chronic Inhalation (RfC).[128] Acrolein is also not included in the CD-C DEIS assessment. BLM must include a more comprehensive analysis of HAP impacts and, in addition to the HAPs identified above, the BLM should also assess any HAP impacts associated with volatile emissions from hydraulic fracturing fluids.

Upper Air Sounding Data Used as Input to the AERMOD Modeling Analysis May Not Be Representative of Conditions in the Project Area

Near-field modeling is based on three years of surface meteorological data from Wamsutter and sounding data from Riverton.[129] Soundings from Riverton, which is far from the project area, are not likely to represent conditions in the project area. The representativeness could be at least roughly evaluated by comparing MM5 or other meteorological model outputs for Riverton with those for grid cells in the project area. Then implications of any bias in the soundings for the AERMOD modeling should be assessed.

The Emissions Inventories Underestimate Emissions and Therefore the Modeled Impacts are Likely Also Underestimated

The inventories used in the DEIS rely heavily on operator-provided data without assurance that these critical assumptions are conservative and/or reflect upper limits on operating factors. Following are specifics about important source categories that rely heavily on operator-supplied data.

Heaters – Heater emissions make up a large fraction of the NO_x and PM inventories. Specifically, heater emissions account for 39% of NO_x emissions

[125] BLM CD-C DEIS p. 4-49.
[126] *See* BLM Gasco Energy Project FEIS, Table 4-12, Table 4-19 and Appendix H. April 2010.
[127] BLM Gasco FEIS Table 4-19.
[128] BLM Gasco FEIS Appendix H p. H-45.
[129] BLM CD-C AQTSD p. 3-2.

from new project wells, 31% of $PM_{2.5}$ emissions from new project wells, 35% of NO_x emissions from new and existing wells and 28% of $PM_{2.5}$ emissions from new and existing wells.[130] Heater emissions are based on operator-supplied data for the number of wells that have heaters and the number of units per well. In addition, operator-supplied data for time used and cycle fraction are used to determine actual firing hours used for the inventory.[131] The DEIS reports that heaters were assumed to not operate continuously.[132] Given the fact that heaters are such a significant contributor to overall NO_x and VOC emissions, BLM must either establish restrictions on maximum operating hours reflective of what was modeled or revise the modeling based on continuous operation.

Fugitive devices – Fugitive devices make up a large fraction of the VOC inventory with 40% of VOC emissions from new project wells coming from fugitive devices and 11% of VOC emissions from new and existing project wells.[133] Fugitive device emissions are based on operator data for the number of devices.[134] BLM should require reporting on the number of devices and make necessary changes to the inventory and modeling if operator-provided estimates do not reflect actual device populations.

Well venting – Well venting makes up a large fraction of the VOC inventory with 45% of VOC emissions from new project wells coming from well venting and 8% of VOC emissions from new and existing project wells.[135] Well venting emissions are based on operator supplied VOC emission factors.[136] The emissions estimates seem low as compared to other industry-reported data.[137] BLM should require operators to confirm emission rates and make adjustments to better reflect emissions and associated impacts, if needed.

Dehydrators – The DEIS assumes 100% control of dehydrator emissions from new project wells based on operator data.[138] And, in fact, the inventories reflect

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[130] BLM CD-C AQTSD Appendix H Tables 254, 258, 270 and 274 on pp. H-186, H-190, H-203 and H-207.
[131] BLM CD-C AQTSD Appendix H pp. H-44 and H-152.
[132] BLM CD-C DEIS at 2-17.
[133] BLM CD-C AQTSD Appendix H Tables 255 and 271 on pp. H-187 and H-204.
[134] BLM CD-C AQTSD Appendix H pp. H-45 – 47 and H-154-155.
[135] BLM CD-C AQTSD Appendix H Tables 255 and 271 on pp. H-187 and H-204.
[136] BLM CD-C AQTSD Appendix H p. H-52 and H-160.
[137] *See e.g.* Terri Shires & Miriam Lev-On, API/ANGA, *Characterizing Pivotal Sources of Methane Emissions from Unconventional Natural Gas Production* (API/ANGA Report) (Sept. 21, 2012), App. C. Methane emissions estimates from liquids unloading in the API/ANGA report are 319,664 metric tons CH_4/yr for 36,806 wells with plunger lift systems and 28,863 wells without plunger lift systems resulting a total emission rate of 4.9 tons CH_4 /yr per well compared with the emission factor used in the CD-C inventory of 3.624 tons CH_4/yr per well. *See* API/ANGA Report Table 6 p.14.
[138] BLM CD-C AQTSD Appendix H p. H-162.

zero emissions from this source starting in 2008.[139] Yet the DEIS reports that the control for dehydrators is based on WYDEQ-AQD BACT of 98% control.[140] Dehydrators make up a large fraction of the existing well VOC and HAP inventories with 38% of VOC emissions coming from new and existing project wells and 77% of benzene emissions, 95% of ethylbenzene emissions, 91% of toluene emissions and 89% of xylene emissions coming from new and existing project wells.[141] Dehydrator emissions from existing wells are based on operator data for VOC emissions, the number of dehydrators per well and production data (MMscf/yr/well).[142] If BLM is going to assume 100% control at dehydrators, it must establish an enforceable requirement that all dehydrators at new wells actually control emissions by 100%, not 98%, as Wyoming requires, and must also verify the operator-supplied data for dehydrator emissions at existing wells.

Pneumatic pumps – The DEIS assumes 100% control of pneumatic pump emissions from new project wells based on operator data.[143] And, in fact, the inventories reflect zero emissions from this source in inventories starting in 2008.[144] Yet the DEIS reports that the control for pneumatic pumps is based on WYDEQ-AQD BACT of 98% control.[145] Pneumatic pumps make up a large fraction of existing well VOC and n-Hexane emissions with 25% of VOC emissions and 35% of n-Hexane emissions from existing wells coming from pneumatic pumps.[146] Pneumatic pump emissions from existing wells are based on operator data for chemical usage data and vented volumes.[147] If BLM assumes 100% control of pneumatic pump emissions, BLM must establish an enforceable requirement that all pneumatic pumps at new wells control emissions by 100%, not 98%, as Wyoming requires, and must also verify the operator-supplied data for existing wells.

Condensate tanks – The DEIS assumes 100% control of condensate tank emissions from new project wells based on operator data.[148] And, in fact, the inventories reflect zero emissions from this source in inventories starting in 2008.[149] Yet the DEIS reports that control for tanks would be based on WYDEQ-AQD BACT of 98% control.[150] Moreover, WY DEQ-AQD BACT requirements do not require 98% control of all condensate tank emissions, but rather only require

[139] BLM CD-C AQTSD Appendix H Table 255 p. H-187 and Appendix H Tables 262-265 pp. H-194-197.
[140] BLM CD-C AQTSD pp. 2-1 – 2-2.
[141] BLM CD-C AQTSD Appendix H Tables 271, 278-81 on pp. H-204 and H-211 – H-214.
[142] BLM CD-C AQTSD Appendix H pp. H-67 and H-171.
[143] BLM CD-C AQTSD Appendix H p. H-164.
[144] BLM CD-C AQTSD Appendix H Table 255 p. H-187 and Appendix H Table 261 p. H-193.
[145] BLM CD-C AQTSD p. 2-2.
[146] BLM CD-C AQTSD Appendix H Table 114 p. H-85 and Appendix H Table 120 p. H-91.
[147] BLM CD-C AQTSD Appendix H p. H-74.
[148] BLM CD-C AQTSD Appendix H p. H-161.
[149] BLM CD-C AQTSD Appendix H Table 255 p. H-187 and Appendix H Table 261 p. H-193.
[150] BLM CD-C AQTSD pp. 2-1 – 2-2.

control of flash emissions.[151] Condensate tanks make up a large fraction of existing well VOC and n-Hexane emissions with 18% of VOC emissions and 20% of n-Hexane emissions from existing wells coming from this source.[152] Condensate tank emissions from existing wells are based on an operator-provided assumption that 68% of the condensate volume is controlled and also on assumed working and breathing loss calculations based entirely on operator data.[153] Before 100% control of condensate tank emissions can be assumed, BLM must establish an enforceable requirement that all condensate tanks at new wells actually control emissions by 100%, not 98%, as Wyoming requires, and must also verify the operator-supplied data for existing wells. Even then, an assumption of 100% control is overly optimistic as it assumes 100% compliance and zero operational errors.

Pneumatic devices – Pneumatic devices are assumed, based on operator information, to be 100% no bleed devices and therefore no emissions are included from these sources in any of the new and existing source inventories for the DEIS.[154] Yet the WYDEQ-AQD BACT requirements for pneumatic devices is to install "low- or no-bleed controllers at all new facilities".[155] BLM must establish an enforceable requirement that operators install only no-bleed pneumatic devices, not low bleed controllers, at new wells if it is going to assume 100% use of no-bleed devices.

Traffic – Traffic associated with well pad construction, drilling, well completion, well workover, and production make up a large fraction of the PM inventories. Specifically, traffic during construction, drilling, completion and production account for 82% of PM_{10} emissions from new project wells and 37% of $PM_{2.5}$ emissions from new project wells.[156] Traffic estimates are based on operator data for the assumed weight of vehicles, speeds driven, distance traveled, number of trips made and total miles traveled.[157] BLM should require operators to confirm activity data and make adjustments to better reflect emissions and associated impacts, if needed.

Drilling and completion equipment – The inventory identifies specific operator data on the use of 125 horsepower rigs. Specifically, these rigs are assumed to operate only in winter and are modeled assuming a 50% load factor.[158] This is an

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[151] WY WYDEQ-AQD Oil and Gas Production Facilities Ch. 6, Sec. 2 Permitting Guidance (March 2010), available at http://deq.state.wy.us/aqd/Oil%20and%20Gas/March%202010%20FINAL%20O&G%20GUIDANCE.pdf.
[152] BLM CD-C AQTSD Appendix H Table 114 p. H-85 and Appendix H Table 120 p. H-91.
[153] BLM CD-C AQTSD Appendix H pp. H-61 and H-56.
[154] BLM CD-C AQTSD p. 2-19.
[155] BLM CD-C AQTSD pp. 2-1 – 2-2.
[156] BLM CD-C AQTSD Appendix H Tables 257 and 258 on pp. H-189 and H-190.
[157] *See*, e.g., pp. H-26, H-29, H-33, H-42, H-72, H-120, H-135, H-128, H-149, H-176
[158] BLM CD-C AQTSD Appendix H p. H-131.

inappropriate way of modeling these wintertime emissions since assuming the rigs are operating at half load all year would tend to underestimate short-term impacts in the wintertime. Spreading the emissions out over the year artificially lowers emissions occurring in winter (when air quality issues are of potentially greater concern). Finally, the assumed duration of drilling and completion appears to be too short. Completions typically require more than the one day indicated in the DEIS.[159] And, in fact, the detailed inventory calculations assume an average of three days per well completion, based on operator data.[160] BLM must adjust the modeling to reflect emissions from three days of completion emissions and must model the 125 horsepower engines at full load in order to adequately characterize short-term air quality impacts, especially in the winter.

Of particular concern is the assumption, based on operator input, that emissions will be completely eliminated from dehydrators, pneumatic pumps, condensate tanks and pneumatic devices. This is not a practical assumption and leads to significant underestimates in the air quality impacts presented in the DEIS from these sources. In reality, these "closed" systems are subject to operator error (*e.g.*, if a tank hatch is inadvertently left open), which may result in significant emissions from these sources. Operating practices may account for the discrepancy seen between the bottom-up emissions inventories in the Denver-Julesburg basin and the top-down NOAA estimates based on ambient measurements that reported significantly higher emissions.[161] BLM must use emissions estimates that reflect reasonable expectations for control efficiencies based on current standards and operating practices, including the challenge of operating and maintaining control equipment at 10,000 remote well sites. In addition, it must impose enforceable requirements to control emissions.

In addition to the significant reliance on operator-supplied data to develop the emissions inventories there are other assumptions made in the inventory that require further justification. Specifically, there is no basis given for the assumption of a 1% per year rate of abandonment for existing wells.[162] BLM must provide supporting evidence that this rate of abandonment is appropriately conservative. Also, the inventory assumes there is no re-stimulation of existing wells. BLM must consider the likelihood that existing wells will be re-stimulated and extend production estimates beyond what is assumed for the inventory to account for this possibility.

In addition to underestimating emissions estimates, the project inventory likely overstates emissions reductions from the application of current regulations. Specifically, WDEQ-AQD (2010) guidance allows for removal of controls if VOC

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[159] BLM CD-C AQTSD p. 3-6, Table 3-2.
[160] BLM CD-C AQTSD Appendix H p. H-139.
[161] Pétron, G., et al. (2012), Hydrocarbon emissions characterization in the Colorado Front Range: A pilot study, J. Geophys. Res., 117, D04304, doi:10.1029/2011JD016360.
[162] BLM CD-C AQTSD p. 2-29.

emissions drop below specified levels but the inventories assume that emissions controls remain in effect through the duration of the project.[163] The DEIS assumes that emissions controls will not be removed once well emissions drop below the limits that trigger WY BACT. This is not a conservative assumption unless the BLM requires all operators to commit to continue implementing these controls. In addition, no consideration is given to the effectiveness of the regulations for assumed controls in the inventory. Invariably, regulatory controls are not 100% effective due to factors such as equipment down-time, upsets and decreases in control efficiency over time. BLM should adjust the inventory to account for a realistic rule effectiveness estimate for the assumed regulatory controls.

The DEIS discusses uncertainty in speciation of flared emissions however absolute quantities of flared emissions (*i.e.*, control effectiveness) are also highly uncertain.[164] As previously mentioned, the control effectiveness of flares is especially uncertain where flares are installed at remote sites without surveillance. And, in fact, the inventory estimates for flared emissions are based on AP-42 emission factors for industrial flares, which typically achieve 98% control efficiency.[165] It is questionable whether that level of control is achieved in practice in the oil and gas sector. Given the fact that the proposed action relies so heavily on flares as control devices, there is great potential for underestimated impacts from this source.

Finally, in order to further assess the integrity of the inventories, BLM should include a comparison of the inventories prepared for the DEIS with the recently completed WRAP Phase III inventories for the Wind River, Powder River and Greater Green River Basins.[166] Given that WRAP Phase III inventories are complete now for some of the basins for which the BLM used operator-supplied inventories, it is critical that the BLM compare and fully reconcile the inventories in the DEIS with the WRAP Phase III data.

The DEIS Does Not Include a Comprehensive Regional Inventory for Use in Determining Existing and Reasonably Foreseeable Cumulative Air Quality Impacts

In addition to a comprehensive emissions inventory of the various development and operation sources anticipated under the proposed action and alternatives, the BLM must also prepare an inventory of all existing and reasonably foreseeable air pollution sources expected to impact the same areas impacted by emissions from the proposed development. These sources include any State- and Federal-permitted sources, any state Oil and Gas Conservation Commission

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[163] BLM CD-C AQTSD pp. ES-3 and 2-2.
[164] BLM CD-C AQTSD p. 2-27.
[165] *See, e.g.,* BLM CD-C AQTSD Appendix H p. H-164 and EPA AP-42 Section 13.5.
[166] *See* http://www.wrapair2.org/PhaseIII.aspx

permitted wells and all reasonably foreseeable development (RFD) sources (*e.g.*, other NEPA projects, proposed major sources, etc.). BLM must include all emissions from NEPA projects and Resource Management Plans (RMP) in other areas in Wyoming, northeastern Utah and northern Colorado that could be impacting the same area as the proposed development. The remaining development in any NEPA-approved projects in the impacted area must be included in the RFD inventory.

The DEIS presents RFD emissions as well as regional inventories but only for the 4-km by 4-km modeling domain.[167] This 4-km by 4-km study area is too small to be the boundary domain for projecting reasonably foreseeable development impacts. Projects outside this area in Utah and Colorado could impact the same locations that are affected by the CD-C project. In general, the level of detail included in the cumulative inventory is not sufficient to assess whether all relevant sources are included. The emissions inventories should be presented in a more transparent and disaggregated form so that the public can see which specific sources are included in the modeling analysis. Emissions aggregated at the county and state level fail to provide this level of detail.

Within Wyoming, the DEIS RFD inventory includes emissions from a subset of BLM oil and gas projects, including Moxa Arch (existing project, preferred alternative and ROD wells), Beaver Creek, Eagle Prospect, Gun Barrel-Madden Deep-Iron Horse, Pinedale, Hiawatha (Proposed Action) and Jonah.[168] BLM must also include any emissions that are not already included in the baseline inventory in the RFD inventory from several other significant development projects in the area. The Normally Pressured Lance project proposed by Encana Oil & Gas includes up to 3,500 wells over a 10-year period, in the Rock Springs Planning Area adjacent to the Jonah Field, and the emissions from this project must be included in the RFD inventory. In addition, the multi-operator LaBarge Platform Infill Oil and Gas project for a proposed 838 wells in the Pinedale Planning Area must also be included in the RFD inventory. The inventory must also include RFD emissions from the development areas within the Atlantic Rim Project Area and must include updated emissions data for the Moneta Divide Natural Gas and Oil Development project proposed by Encana Oil & Gas and Burlington Resources Oil and Gas Company that includes up to 4,250 wells in the Fremont and Natrona Counties (formerly Gun Barrel-Madden Deep-Iron Horse Project).

In addition BLM must include all other, smaller, projects that could impact the same areas impacted by the proposed development including the Monell Arch and Table Rock Oil and Gas Development Projects in the Rock Springs Field Office.

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[167] BLM CD-C DEIS Tables 5.5-1 – 5.5-3 pp. 5-12 – 5-16.
[168] BLM CD-C DEIS Table 5.5-1 p. 5-12.

Furthermore, projects in the Uinta Basin in northeast Utah that impact the same areas impacted by the proposed development must be added to the RFD inventory including Greater Natural Buttes (Anadarko Petroleum), Greater Chapita Wells (EOG), Greater Monument Butte (Newfield), Uinta Basin (Gasco), West Tavaputs Plateau (BBC), Big Pack (Enduring Resources), Little Canyon (XTO), River Bend (XTO), South Unit (Berry Petroleum), Southam Canyon (Enduring Resources), Hill Creek (XTO), and North Alger (EOG). Also, known prospects in the Little Snake and Kremmling Planning Areas in northern Colorado must also be included in the RFD inventory.

In the mid-field impact analysis, it's not clear whether the results presented in the DEIS represent a comprehensive look at cumulative impacts.[169] Concentrations presented in the DEIS are not the totals "from all sources" as stated. If the intent is to show the combined effect of the project and RFD sources, the domain for assessing RFD needs to be expanded to include all sources impacting the same areas impacted by the proposed development sources.

Also, BLM must ensure that all of the RMPs that were updated under the 2012 Final Programmatic EIS for oil shale and tar sands leasing and that impact the project area (as well as the areas outside the project area that are impacted by the planned development under the DEIS) are fully considered in the cumulative inventory.[170] This would include, for example, the additional electrical power needs for in-situ oil shale production. Under the 2012 PEIS, BLM assumed that a combination of construction of new power plants and expansion of existing power plants would occur and that future in-situ projects would require somewhere around 600 megawatts (MW) of additional electricity generation capacity when commercial production levels of 50,000 barrels of oil shale per day are reached.[171] BLM must ensure that the air quality impacts from potential oil shale development in the region are fully considered in the cumulative impact analysis.

BLM must be scrupulous in its cumulative impact analysis for this and future analyses for the area in order to ensure that the development is not improperly segmented. That is to say, BLM must – for this EIS and for all future project-specific EISs and EAs in the area – perform a comprehensive cumulative impact assessment so as not to allow individual projects to proceed that would contribute to cumulative impacts in the area.

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[169] *See* BLM CD-C DEIS Table 5.5-4 p. 5-17.

[170] In 2012, the BLM published a Final PEIS that amended 10 resource management plans in Utah, Colorado, and Wyoming to make approximately 677,000 acres of public lands potentially available for application for commercial oil shale leasing and development and 130,000 acres potentially available for tar sands leasing and development. These RMPs included the Colorado River Valley, Grand Junction and White River Field Offices in Colorado; the Monticello, Price, Richfield and Vernal Field Offices in Utah; and the Kemmerer, Rawlins and Rock Springs Field Offices in Wyoming.

[171] Final BLM Oil Shale and Tar Sands PEIS at 4-13. http://ostseis.anl.gov/documents/peis2012/chp/OSTS_Chapter_4.pdf.

The Far-Field Modeling Should Include Additional Designated Wilderness Areas that Could Be Affected by the Proposed Development

The DEIS analysis should be expanded to include the following wilderness areas, which are not currently considered in the DEIS, that could potentially be impacted by the proposed development and other reasonably foreseeable sources:

Additional Areas that Should Be Considered in the DEIS

Designated Area	Designation	FLM
Encampment River Wilderness Area	1984	USFS
Huston Park Wilderness Area	1984	USFS
Platte River Wilderness Area	1984	USFS
Cloud Peak Wilderness Area	1984	USFS
Gros Ventre Wilderness Area	1984	USFS
High Uintas Wilderness Area	1984	USFS

Not only should these areas have been included in the analysis of project impacts, but the BLM should make sure the modeling domain captures all other sources of air pollution that are impacting these areas. All were designated in 1984, so they are not federal Class I areas, but all have valued resources that could be impacted by air pollution, including scenic vistas and world-class cold water fisheries. They are clearly additional sensitive Class II areas which have been ignored in the current DEIS, which is not acceptable and must be corrected.

IV. The DEIS Does Not Sufficiently Address Greenhouse Gas Emissions and Climate Change Impacts From the Proposed Development

The Council on Environmental Quality (CEQ) has released new (2010) draft guidance on how NEPA should consider and evaluate greenhouse gas emissions and climate change. The draft guidance outlines how federal agencies should consider climate change issues under NEPA. Under this draft guidance, the agency should quantify and disclose its estimate of the expected, annual direct and indirect greenhouse gas emissions. Specifically, where a proposed action is anticipated to cause direct, annual emissions of 25,000 metric tons or more of carbon dioxide equivalent emissions (CO_{2eq}) greenhouse gas emissions, a quantitative and qualitative assessment is required together with the consideration of mitigation measures and reasonable alternatives to reduce greenhouse gas emissions.[172]

[172] Note that, land management agencies should not be granted a pass from NEPA's duty to evaluate impacts and consider alternatives to mitigate GHG emissions. Indeed, the activities

The DEIS includes estimates for CO_{2eq} for the Proposed Action.[173] According to BLM estimates, the increase in emissions from 2008 to 2022 from the Proposed Action and No Action alternatives is 4,633,242 metric tons per year CO_{2eq}.[174] Project emissions of CO_{2eq} clearly exceed the 25,000 tons per year threshold for completing a quantitative and qualitative assessment of impacts, including consideration of mitigation measures.[175] Therefore, this type of assessment should be included in the DEIS. The DEIS should also quantify methane emissions, an even more potent greenhouse gas than CO_2.

EPA has commented, in recent NEPA reviews, that an analysis of reasonable alternatives should be performed that includes an assessment of potential means to mitigate project-related greenhouse gas emissions.[176] Specifically, EPA suggested assessing carbon capture and sequestration technologies, measures from BLM's Supplemental Information Report for the eight EAs in Montana, North Dakota and South Dakota and EPA's GasSTAR technologies.[177] These measures should be considered as alternatives pursuant to NEPA in the CD-C DEIS and, moreover, should be enforced through lease stipulations or mandatory conditions of approval.

The DEIS should include a quantitative assessment of the impacts from greenhouse gas emissions, and in particular methane emissions, from the proposed development and mitigation measures for reducing impacts from methane emissions. This assessment should consider the full-sweep of likely greenhouse gas emissions sources if the DEIS's proposed action moves forward. BLM should ensure that its inventory of GHG sources is based on the best available quantification methods. Given the uncertainty in many of the estimation methods for greenhouse gas emissions from the natural gas industry, the BLM should rely on the most up to date estimation methods and tools and should consult the emissions estimate methodologies finalized by EPA in its recent Greenhouse Gas Reporting Rule for Petroleum and Natural Gas Systems (40 C.F.R. Part 98, Subpart W).[178]

Importantly, as detailed below, the BLM's quantitative assessment should account for methane's long-term (100-year) global warming impact and, also,

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contemplated by the DEIS show precisely why land management agencies should evaluate and consider alternatives to mitigate GHG emissions, in particular methane emissions.

[173] BLM CD-C DEIS Table 4.5-3 p. 4-45.

[174] BLM CD-C DEIS Table 4.5-3 p. 4-45.

[175] BLM CD-C DEIS Table 4.5-3 p. 4-45.

[176] January 7, 2011, EPA, Comments on the Gasco Uinta Basin Natural Gas Development Project Draft EIS, CEQ # 20100386.

[177] BLM's Climate Change Supplemental Informational Report for the eight EAs in Montana, North Dakota and South Dakota – http://www.blm.gov/mt/st/en/prog/energy/oil_and_gas/leasing/leasingEAs.html.

[178] 75 FR 74458, November 30, 2010.

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"). 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.[179] Although it has a relatively short atmospheric lifetime of about 12 years, methane is nonetheless a potent greenhouse gas. EPA assumes that each molecule of methane is 21 times as potent as carbon dioxide (CO_2) over a 100-year time horizon, a global warming potential (GWP) based on the Intergovernmental Panel on Climate Change's Second Assessment Report from 1996.[180] However, more recent peer-reviewed science indicates that methane is 33 times as potent as CO_2 over 100 years and 105 times as potent as CO_2 over 20 years.[181] Methane, thus, is a prime contributor to short-term climate change over the next few decades and a prime target for near-term GHG reductions. And, in fact, there are many proven technologies and practices already available to reduce significantly the methane emissions from oil and gas operations. These technologies also offer opportunities for significant cost-savings from recovered methane gas. Indeed, reducing methane emissions is important to not only better protect the climate, but to prevent waste of the oil and gas resource itself and the potential loss of economic value, including royalties.

There is a large body of scientific work documenting the adverse impacts to public health and welfare from climate change caused by greenhouse emissions, such as methane. More recently, scientific studies have also demonstrated that these same methane emissions contribute to the formation of ground-level ozone.[182] Specifically, the U.S. Climate Change Science Program recently reported that methane reductions accomplish the dual goals of addressing climate change and reducing ozone pollution.[183] Methane reductions have a direct impact on both climate change and ozone pollution. In addition, many of the proven methane emission controls for the oil and gas sector also reduce VOCs and HAPs. The associated air quality benefits that result from reductions in VOC and HAP emissions are a huge co-benefit of methane reduction

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[179] U.S. Emissions Inventory 2007: Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005.

[180] http://www.epa.gov/cleanenergy/documents/sources/2008_GHG_Fast_Facts.pdf.

[181] Shindell *et al*., "Improved Attribution of Climate Forcing to Emissions," Science 2009 326 (5953), p. 716 (www.sciencemag.org/cgi/content/abstract/326/5953/716).

[182] *See, e.g.*, Arlene M. Fiore *et al.*, "Characterizing the Tropospheric Ozone Response to Methane Emission Controls and the Benefits to Climate and Air Quality," Journal of Geophysical Research Vol. 113, April 30, 2008, p.1 ("[I]n the presence of nitrogen oxides (NO_x), tropospheric CH4 [methane] oxidation leads to the formation of O_3 [ozone].").

[183] *See* Hiram Levy II *et al.*, U.S. Climate Change Science Program Synthesis and Assessment Product 3.2, "Climate Projections Based on Emissions Scenarios for Long-Lived and Short-Lived Radiatively Active Gases and Aerosols", September 2008, p. 65, http://www.climatescience.gov/Library/sap/sap3-2/final-report/ (finding that reducing methane emissions "lead[s] to reduced levels of atmospheric ozone, thereby improving air quality" and "lead[s] to reduced global warming").

technologies.

In fact, the recent air quality studies in the Uinta Basin in Utah found evidence that elevated methane concentrations from nearby oil and gas operations could be contributing to ozone formation:

> [T]he CH_4 concentrations measured at the Red Wash [air monitoring] site (2.7-5.5 ppm) were significantly above the Northern Hemispheric background levels. CH_4 is usually considered non-reactive due to its relative slow reaction rates, but at levels observed at the Red Wash site, CH_4 could be a significant player in atmospheric photochemistry of ozone formation.[184]

BLM should assess the potential impacts of methane emissions from the proposed development on ozone levels in the project area.

There are numerous existing control technologies for oil and gas emission sources that achieve cost-effective reductions in methane emissions, including:

(1) *Well Cleanup Operations (Liquids Unloading).* Required use of plunger lift systems and well monitoring technologies to improve operational systems during well cleanup operations can significantly reduce methane and VOC emissions and increase gas production.[185]
(2) *Well Completions*. Significant salable gas can be recovered with the use of reduced emissions completions.
(3) *Compressors.* Use of compressor rod-packing technologies and the use of dry seals in centrifugal compressors are both cost-effective means to reduce VOC emissions and can reduce methane emissions by more than 90% and up to 99%, respectively.
(4) *Pneumatic Devices.* Use of no bleed pneumatic devices is a cost-effective measure that can virtually eliminate methane and VOC emissions.
(5) *Dehydrator Units*. Zero emission dehydrators can be considered a technically and economically feasible option for new dehydrator installations and virtually eliminate methane and HAP emissions.
(6) *Storage Tanks.* Use of vapor recovery units at crude oil and condensate storage tanks are cost-effective and can reduce methane and VOC emissions by at least 98%.
(7) *Enhanced Operating and Maintenance Practices for Pipelines.* During routine maintenance of pipelines, operator use of pump-down techniques reduces the

[184] Energy Dynamics Laboratory, Utah State University Research Foundation, Final Report: Uinta Basin Winter Ozone and Air Quality Study December 2010-March 2011, EDL/11-039, June 14, 2011, p. 97.
[185] According to EPA, benefits from increased gas production are “well- and reservoir-specific and will vary considerably.” Lessons Learned, Natural Gas STAR Partners, “Installing Plunger Lift Systems in Gas Wells”, October 2006, http://www.epa.gov/gasstar/documents/ll_plungerlift.pdf

gas line pressure in the pipeline before venting and can recover up to 90% of the gas in the line.[186] Use of in-line compressors is almost always cost effective and use of additional portable compressors to achieve higher gas recovery may also be justified in some cases. In addition to methane reductions, pump down techniques virtually eliminate HAP emissions.
(8) *Leak Detection Programs.* Equipment leak detection and repair programs across all sectors (*i.e.*, processing, production, transmission and storage) can be cost-effective and significantly reduce methane and VOC emissions.

WYDEQ already requires control of fugitive emissions in permits in the Jonah-Pinedale Anticline development area and BLM must do the same here.[187] The Santa Barbara County Air Pollution Control District requires quarterly monitoring of fugitive emissions from equipment located at oil and gas production fields and processing plants as well as other facilities with specific requirements for operation and repair so as to minimize fugitive emissions.[188] Ohio EPA has leak detection and repair (LDAR) requirements for equipment and pipeline leaks at well sites in its General Permit for oil and gas well site production operations.[189] And Pennsylvania has recently finalized advanced equipment leak detection and repair requirements in its revised general permit for natural gas compression and processing facilities that include the use of audible, visual and olfactory (AVO) inspections and quarterly monitoring using forward looking infrared (FLIR) cameras.[190] And even though EPA failed to add LDAR requirements for well sites to the recently updated NSPS for the oil and gas sector, EPA's own technical review demonstrates LDAR is cost-effective for reducing methane leaks.[191] BLM should consider the practices of all of these

[186] Lessons Learned, Natural Gas STAR Partners, "Using Pipeline Pump-Down Techniques to Lower Gas Line Pressure Before Maintenance", October 2006, http://www.epa.gov/gasstar/documents/ll_pipeline.pdf.
[187] *See*, *e.g.,* sample Leak Detection and Repair protocols being implemented in the Jonah Pinedale Development Area: QEP Energy Company's Leak Detection and Repair Program and SWEPI LP Leak Detection and Repair Program available from WYDEQ-AQD.
[188] Santa Barbara County Air Pollution Control District, R. 331: Fugitive Emissions Inspection and Maintenance. Available online at http://www.arb.ca.gov/DRDB/SB/CURHTML/R331.HTM
[189] Oil and Gas Well Site Production Operations (GP 12), effective 1/31/12, pp. 37-40. Available online at http://www.epa.ohio.gov/portals/27/genpermit/GP12_PTIO.pdf
[190] Commonwealth of Pennsylvania Department of Environmental Protection Air Quality Programs General Plan Approval and/or General Operating Permit BAQ-GPA/GP-5, 2/01/2013, Section H Requirements for Equipment Leaks, p. 21. Available online at http://www.dep.state.pa.us/dep/deputate/airwaste/aq/permits/gp/GP-5_2-1-2013.pdf
[191] EPA 453/R-11-002 Oil and Gas Sector: Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution, Background Technical Support Document for Proposed Standards, July 2011, Section 8. Note that, EPA's analysis did not consider methane savings so LDAR is in fact even more cost-effective when considering saved gas. EPA determined that implementing a Subpart VVa LDAR program at wellpads containing at least five wellheads is cost-effective at $4,318 per ton of methane reduced not including gas savings, as shown in Table 8-13 on p. 8-25. EPA also determined that the same Subpart VVa LDAR program is also cost-effective at gathering and boosting stations, processing plants and transmission and storage facilities, as shown in Table 8-13.

agencies for reducing methane emissions, and achieving significant VOC and HAP co-benefits, in the CD-C EIS.

A recent GAO report on federal oil and gas leases concludes that around 40% of natural gas from onshore federal leases that is vented and flared could, in fact, be economically recovered with currently available control technologies.[192] The GAO report goes on to specifically recommend that BLM "should revise its guidance to operators to make it clear that technologies should be used where they can economically capture sources of vented and flared gas, including gas from liquid unloading, well completions, pneumatic valves, and glycol dehydrators" and that BLM should "consider the expanded use of infrared cameras, where economical, to improve reporting of emission sources and to identify opportunities to minimize lost gas."[193] GAO concludes that "increased implementation of available venting and flaring reduction technologies, to the extent possible, could increase sales volumes and revenues for operators, increase royalty payments to the federal government, and decrease emissions of greenhouse gases."[194] According to the GAO report, "EPA suggested that [GAO] recommend to BLM and BOEMRE that they require the use of the best available venting and flaring control measures during leasing or drilling permitting."[195] BLM must implement these recommendations for this DEIS.

BLM should include a comprehensive set of actions to address greenhouse gas emissions and consider these actions in an alternative in the DEIS – an alternative that would mandate these actions as a lease stipulation, or APD best management practices or conditions of approval. The DEIS should seriously explore the impact of emissions of methane from the leasing and potential mitigation methods to reduce the associated impacts. The DEIS inventories GHG emissions from the proposed project but then fails to seriously investigate the many cost-effective alternatives available to avoid or minimize the GHG impacts from the project as required by 40 C.F.R. § 1502.1, 40 C.F.R. § 1502.14 and 40 C.F.R. § 1502.16, not to mention the policies of this administration.

V. BLM Must Include Adequate Plans to Protect Air Quality in the Area as Part of This DEIS

BLM has not adequately evaluated the air quality impacts of the alternatives proposed in the DEIS and has failed to propose enforceable mitigation measures to assure no adverse impacts on air quality will occur in the affected area. BLM must fulfill its obligations under NEPA, FLPMA, and its easement, right-of-way,

[192] GAO-11-34 Federal Oil and Gas Leases: Opportunities Exist to Capture Vented and Flared Natural Gas, Which Would Increase Royalty Payments and Reduce Greenhouse Gases, October 2010.
[193] *Id.* at 34.
[194] *Id.* at 33.
[195] *Id.* at 35.

and permit regulations to disclose whether the proposed development will cause significant impacts (*e.g.*, Clean Air Act (CAA) violations), and to consider mitigation under NEPA to prevent any such significant impacts. (40 C.F.R. § 1502.14(f), 40 C.F.R. § 1502.16(h)). BLM relies on Wyoming's BACT and Presumptive BACT permitting requirements and operator-commitments to use Tier 2 engines as the only enforceable measures in the DEIS. BLM says it will conduct further modeling for the final EIS based on additional measures already in practice in the CD-C project area:

> These [measures other than the WY BACT requirements and Tier 2 engine requirements] and other mitigation options or control measures may already be in practice in the CD-C project area to varying degrees. The reduction in emissions brought about by application of any of these measures could be estimated with additional modeling based on more detailed descriptions of the actual drilling and production processes used by the Operators. However, additional and more detailed information related to those practices would be needed from the Operators. This information will be gathered, and additional modeling analyses will be performed, during preparation of the FEIS. The results of the revised modeling analyses based on the selection of mitigation measures will be presented in the FEIS. Mitigation measures determined to be necessary to demonstrate compliance with the applicable NAAQS and WAAQS, as predicted in the revised modeling analyses, will be a required condition in the Record of Decision.[196]

A more cautious approach is critical given the magnitude of the increase in emissions from the proposed project and the current and predicted air quality concerns in the area. This DEIS must include a set of comprehensive mitigation measures, based on revised modeling that takes into account all of the deficiencies noted in these comments, that ensure there will be no adverse impacts to air quality from the proposed development. And, it is inappropriate, and defeats informed agency and public participation in the NEPA process—two hallmark requirements of NEPA—to leave decision making to the FEIS or even record of decision stage, when there is no further opportunity for public comment and involvement in the NEPA process.

Exceedances of the 1-hour NO_2 standard, widespread elevated ozone concentrations, visibility impacts and excessive nitrogen deposition in sensitive wilderness areas near the project area indicate the need for additional NO_x reductions. This could be achieved through field electrification, requirement of Tier 4 drill rigs and Tier 2 or better construction equipment, and centralization of well pad production facilities (*e.g.*, to reduce emissions from heaters).[197]

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[196] BLM CD-C DEIS p. 4-70.

[197] In addition to centralized gas well gathering facilities, which will result in reduced numbers of heaters, operators should be required to meet strict emissions standards for NOx emissions from

Exceedances of the 24-hour $PM_{2.5}$ standard supports requirements for field electrification, steps to minimize traffic (*e.g.*, through centralization of well pad production facilities), and Tier 2 or better construction equipment. Concerns about ozone impacts and climate change warrant addressing fugitive VOC and methane emissions through implementation of all available technologies and practices to reduce emissions. In particular, BLM should require advanced leak detection and repair protocols, the use of plunger lifts and "smart" well monitoring, high-efficiency (*i.e.*, minimum of 98% VOC destruction efficiency) flares coupled with auto-igniters and surveillance systems, the use of "green completion" practices that provide for the capture rather than combustion of saleable or otherwise usable gas, and the use of pump-down techniques during pipeline maintenance activities. Concern about elevated formaldehyde concentrations further necessitates the need to limit flare emissions and institute requirements that ensure proper operation of flares.

In general, maximum pad spacing should be established at a distance of at least 40 acres and greater setbacks should be required. At a minimum, setbacks—defined as the distance from the wellhead to an occupied building or outside venues—of 250 meters should be required and even greater setbacks (*e.g.*, 300 meters) should be considered in areas closer to populated areas. The Colorado Oil and Gas Conservation Commission has given preliminary approval to revised setback requirements on the Front Range of Colorado. The new provisions would require that setbacks be extended to 300 meters near occupied structures.[198] The State of Maryland also requires 300-meter setbacks from occupied structures.[199]

The Upper Green River Basin Air Quality Citizens Advisory Task Force recently finalized consensus recommendations to the WYDEQ for reducing ozone and these recommendations should be considered by BLM for the CD-C project development.[200] BLM should adhere to the consensus recommendations—which as a member of the task force it supported—and, specifically, should establish control requirements for achieving NO_x reductions from drill rigs as well as from completions engines, should implement leak detection and repair programs to control fugitive VOC emissions and should develop controls to reduce fugitive

heaters. Many California air districts currently impose emission standards for small process heaters (as small as 0.6 mmBTU/hr) limiting NOx emissions to 30 ppm. These limits are met through a range of controls including lowering temperatures, insulating units and regular tuning to increase combustion efficiency. *See* San Diego County Air Pollution Control District Rule 69.2.1, South Coast Air Quality Management District Rule 1146.1, Ventura County Air Pollution Control District Rule 74.15.1, Santa Barbara County Air Pollution Control District Rule 361.

[198] State of Colorado, Oil and Gas Conservation Commission, Press Release, 1/9/13, available at http://cogcc.state.co.us/RR_HF2012/Setbacks/COGCC_APPROVES_SWEEPING_NEW_SETBACK_RULES.pdf

[199] Md. Code Regs. 26.19.01.09 (G)

[200] Upper Green River Basin Air Quality Citizens Advisory Task Force Recommendations to the Wyoming Department of Environmental Quality FINAL DRAFT September 19, 2012.

VOC emissions from storage tanks and evaporation and produced water ponds.[201]

BLM has required other mitigation measures for other oil and gas development projects in other areas that should also be considered for this DEIS. For example, the recent Colorado River Valley Field Office Draft RMP laid out air quality management actions to control emissions from oil and gas sources in the project area under the proposed alternatives.[202] These management actions include the following additional air quality controls that are not listed as enforceable mitigation measures for the CD-C project: (1) 94% reduction in fugitive dust from roads; (2) the use of Tier 4 engines for all new and existing drill rig engines and hydraulic fracturing pump engines; (3) twice daily watering during construction activities; and (4) electric compression at compressor stations.[203] These measures should also be considered as required mitigation measures for this DEIS. In addition, BLM's Greater Natural Buttes FEIS in Utah requires the following mitigation measures for reducing VOC emissions that are not included in the CD-C project and should be: (1) catalysts on all natural gas-fired compressor engines to reduce VOCs; and (2) an inspection and maintenance program to reduce VOCs that includes performing inspections of thief hatch seals and Enardo pressure relief valves to ensure proper operation and reviewing gathering system pressures to evaluate any areas where gathering pressure may be reduced, resulting in lower flash losses from condensate storage tanks.[204]

BLM should also include a reference to the new federal EPA NSPS Subpart OOOO requirements for the oil and gas sector (*e.g.*, in the DEIS at 3-59) and include a review of the associated federal control requirements that will be implemented over the course of the project.[205]

BLM should also consider the latest mitigation information and recommendations from the Uinta Basin winter air quality study in Utah as it develops a mitigation plan for this DEIS. Specifically, the interim findings suggest the use of targeted control strategies for ozone, as follows:

> [T]he reactivity of the VOC mixture can affect the optimal ozone control strategy, and it may be possible to reduce ozone levels more effectively by identifying targeted control strategies for high reactivity VOC, such as aromatic, aldehyde and alkene species.[206]

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[201] *See* UGRB Air Quality Citizens Advisory Task Force Recommendations #s 4-7.
[202] BLM CRVFO DRMP TSD Table 2-3.
[203] BLM CRVFO DRMP TSD Table 2-3.
[204] BLM Greater Natural Buttes FEIS, March 2012, p. 4-15.
[205] 77 FR 49489, August 16, 2012.
[206] 2012 Uintah Basin Winter Ozone & Air Quality Study – Summary of Interim Findings, Ongoing Analyses, Additional Recommended Reasearch, and Possible Mitigation Strategies, Prepared by

And in addition to direct VOC control, the EPA's Natural Gas STAR Program has compiled detailed information from many Natural Gas STAR partners that have implemented various emission control technologies or practices and achieved cost effective methane reductions (that would also reduce VOC emissions as a co-benefit in many cases and would also help to address ozone). BLM's Best Management Practices (BMPs), California's Air Resources Board's Clearinghouse of Non-CO_2 Greenhouse Gas Emission Control Technologies and the Four Corners Air Quality Task Force Mitigation Measures for oil and gas are also good examples of mitigation strategies that should be considered in the DEIS.[207]

In light of the aforementioned oil and gas emissions control measures, BLM should require leak detection and repair at all possible locations (such programs are well documented by Gas STAR partners for reducing methane emissions and are requirements in some counties in California such as South Coast Air Quality Management District, San Joaquin Valley Air Pollution Control District and Santa Barbara County).[208] Specifically, the Leak Detection and Repair protocols being implemented by WYDEQ-AQD in the Jonah-Pinedale Development Area should also be required for the CD-C project area. Operators should be required to commit to a comprehensive, periodic and enforceable leak detection and repair program designed to address all potential hydrocarbon leaks using state-of-the-art leak detection technologies (*e.g.*, infrared gas imaging, optical remote leak detection, etc.). The UGRB Air Quality Citizens Advisory Task Force Consensus Recommendations can also be used as a guide for establishing LDAR requirements in the CD-C project area. Specifically, these recommendations include the establishment of a "fit-for-purpose program which may include Method 21, audio-visual-olafactory (AVO), or FLIR Camera" technologies and apply to all new, modified and existing sources."[209]

In addition, BLM must implement an adaptive management strategy as part of this DEIS. BLM is implementing such a strategy in the Upper Green River Basin in Wyoming and for the Greater Natural Buttes FEIS in Utah and is also

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researchers and air quality managers at USU/EDL, Alpine Geophysics, ENVIRON, UDEQ and EPA, August 7, 2012.

[207] BLM, Air Resource BMPs, www.blm.gov/bmp, ARB, http://www.arb.ca.gov/cc/non-co2-clearinghouse/non-co2-clearinghouse.htm, and Four Corners Air Quality Task Force, http://www.nmenv.state.nm.us/aqb/4C/Docs/4CAQTF_Report_FINAL.pdf.

[208] SCAQMD, Rule 1173: Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants," http://www.aqmd.gov/rules/reg/reg11/r1173.pdf, San Joaquin Valley Air Pollution Control District, Rule 4401: Steam Enhanced Crude Oil Production Wells," http://www.valleyair.org/rules/currntrules/R4401%20Clean%20Rule.pdf, and Santa Barbara County, Rule 331: Fugitive Emissions Inspection and Maintenance, http://www.arb.ca.gov/DRDB/SB/CURHTML/R331.HTM.

[209] Amended Final UGRB Air Quality Citizens Advisory Task Force Recommendations, September 21, 2012 available online at http://deq.state.wy.us/aqd/Ozone_Taskforce.asp.

proposing a similar strategy in the White River Field Office (WRFO) DRMP update in Colorado. Specifically, for the WRFO the BLM is proposing a comprehensive Air Resources Management Plan that identifies specific management goals, objectives and actions and is carried out through an ongoing and adaptive process, involving input from stakeholders (*e.g.*, EPA and the State), that includes the use of periodic tracking of emissions data and monitoring data to determine the need for additional air modeling and mitigation strategies.[210] The Greater Natural Buttes FEIS includes a similar, comprehensive, Ozone Action Plan, designed to avoid a nonattainment designation in the area.[211] Both the WRFO DRMP and the Greater Natural Buttes FEIS adaptive management plans include an extensive list of emissions reductions strategies, including many of the strategies already mentioned.[212] BLM should consider adopting a similar strategy for the CD-C project to ensure ongoing protection of air resources. At a minimum, production from existing wells should be tracked to ensure VOC emissions decline at least as quickly as projected. This is critical given the uncertainty in projected VOC emissions and the widespread elevated ozone concentrations in the region.

Beyond that, the BLM should consider alternatives that would satisfy the CASAC recommendations for ozone and PM, recommendations which EPA may well soon adopt as mandatory regulations. The many additional mitigation measures in this section provide reasonable and technically feasible means of reducing emissions to achieve those recommendations.

Finally, BLM should consider implementing a self-certification program in order to enhance compliance assurance. Such a program could be modeled off of EPA's Title V permitting and NSPS compliance certification requirements and is warranted given the unique nature of the oil and gas industry with its extremely large number of affected sources spread across vast areas and remote locations. Such a program is also justified given the large amount of operator-reported data relied on in this DEIS analysis. BLM should maximize compliance with the mitigation measures finalized in the ROD by including rigorous self-certification requirements. BLM's regulatory obligation to "require compliance" with air quality standards gives it authority to require such a program as a requirement for engaging in development of the CD-C project area. 43 C.F.R. § 2920.7(b)(3).

VI. Conclusion

[210] BLM WRFO DRMP Appendix J Air Resources Management Plan, August 2012. http://www.blm.gov/co/st/en/BLM_Programs/land_use_planning/rmp/white_river/ogdraftrmpa.html
[211] BLM Greater Natural Buttes FEIS, March 2012, pp. 4-15 – 4-18.
[212] BLM WRFO DRMP Appendix J Air Resources Management Plan, August 2012, Table J-1 at J-7 through J-11 and BLM Greater Natural Buttes FEIS, March 2012, pp. 4-15 – 4-18.

Overall, the BLM has not adequately evaluated the air quality impacts from the CD-C project and has not proposed adequate enforceable mitigation measures to assure no adverse impacts on air quality will occur in the affected area. BLM must meet its statutory obligation to provide for compliance with the CAA and related laws and, more fundamentally, to ensure air resource protection throughout the project area and all other affected areas in the region.