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Ref: EPR-N

APR 06 2007

Mr. Robert A. Bennett, State Director
Bureau of Land Management
Wyoming State Office
5353 Yellowstone Road
Cheyenne, Wyoming 82009

Re: Draft Supplemental Environmental Impact Statement for the Pinedale Anticline Oil and Gas Exploration and Development Project Sublette County, Wyoming CEQ #20060512

Dear Mr. Bennett,

In accordance with our responsibilities under the National Environmental Policy Act (NEPA), 42 U.S.C. Section 4321, et. seq., and Section 309 of the Clean Air Act, 42 U.S.C. Section 7609, the U.S. Environmental Protection Agency Region 8 (EPA) has reviewed the Draft Supplemental Environmental Impact Statement (Draft SEIS) for the Bureau of Land Management's (BLM) proposed Pinedale Anticline Oil and Gas Exploration and Development Project. EPA has also reviewed the subsequent Supplemental Ozone Analysis that was prepared for the project area.

The Draft SEIS supplements a prior NEPA analysis and 2000 Record of Decision authorizing up to 700 producing wells in the Pinedale Anticline Project Area (PAPA). The Draft SEIS assesses both the site-specific and cumulative environmental impacts of year-round drilling, completions, and production of up to 4,399 additional natural gas wells on up to 12,278 acres of new disturbance in the PAPA. The PAPA encompasses 198,034 acres and is located directly south of Pinedale, Wyoming, in Sublette County. The Bridger-Teton National Forest is located west, north, and east of the PAPA and comes within 2.3 miles of the PAPA boundary. In addition, the PAPA is located approximately 11 miles west of the Bridger Wilderness Area. The Bridger Wilderness Area is a federal Class I area under the Clean Air Act, requiring special protection of air quality and air quality related values, such as visibility.

The Draft SEIS considers three alternatives: the Proposed Action, BLM's Preferred Alternative, and No Action. The Proposed Action consists of up to 4,399 additional wells on up to 12,278 acres of new surface disturbance by the year 2023. The drilling and completions within big game crucial winter habitats would occur year-round within concentrated development areas centered in a core area on the Anticline Crest. The Proposed Action also includes installation of a liquids gathering system in the central and southern portions of the PAPA. The

Preferred Alternative is similar to the Proposed Action Alternative and consists of the same project components, including 4,399 additional wells on up to 12,272 acres of disturbance by the year 2023. However, the core development area considered under the Preferred Alternative is slightly different spatially from the Proposed Action. In addition, the Preferred Alternative includes important mitigation measures to address projected air quality impacts from the Proposed Action. The Draft SEIS states the No Action Alternative is based on elements set forth in the 2000 Pinedale Anticline Record of Decision (ROD).

EPA Region 8 has reviewed the Draft SEIS and has three primary concerns which are briefly highlighted in this letter: the range of alternatives analyzed, air quality impacts, and wildlife impacts. The enclosed "Detailed Comments" include more discussion of our concerns regarding these issues as well as our comments on water quality, wetlands, and the proposed performance-based objectives.

RANGE OF ALTERNATIVES IN THE DRAFT SEIS

AL-1 AL-2 FA-1-1

EPA is concerned about the range of alternatives analyzed in the Draft SEIS. In addition to the No Action Alternative, the Draft SEIS considered two similar action alternatives: both the Proposed Action and BLM's Preferred Alternative include development and production of up to 4,399 additional wells on approximately 12,275 acres by the year 2023. The Draft SEIS did identify a "Conservation Alternative" (page 2-38) and a "Reduced Pace of Development Alternative" (page 2-39) but did not analyze them in detail for various reasons. From EPA's perspective, the rationale presented in the Draft SEIS does not provide a sufficient basis for eliminating these from full analysis as reasonable alternatives. We, therefore, believe these alternatives warrant further consideration. In addition, EPA recommends further refinement of BLM's description and analysis of the "No Action" Alternative. Further comments on these issues are included in the enclosed "Detailed Comments."

AL-3 FA-1-2

NEPA requires analysis of a range of reasonable alternatives to a proposed action. Given the magnitude of potential impacts to the environment, EPA recommends the BLM fully analyze at least one additional alternative that considers a development plan with the same number of total wells over a longer period of time. Such an alternative would identify the impacts associated with a slower rate of development on all natural resources affected by the proposed development, as well as interrelated socioeconomic impacts. The full analysis of this alternative seems particularly important on this project given the magnitude of the proposed oil and gas development and its proximity to highly sensitive natural resources, including the Class I Bridger Wilderness Area.

AIR QUALITY IMPACTS

While not a cooperating agency in the development of this Draft SEIS, EPA actively participated on the Air Quality Stakeholders group. Along with the Wyoming Department of Environmental Quality (WDEQ), EPA provided early guidance and comments to the BLM on air quality modeling and mitigation. EPA appreciated this opportunity and we commend BLM for their leadership with the stakeholder group. We believe the resulting air quality modeling and

proposed mitigation measures reflect the efforts of the stakeholder group. By working together we have been able to develop and craft a mitigation strategy that will significantly reduce the visibility impacts to the Class I Bridger Wilderness Area over the next five years. The proposed mitigation strategy would be implemented in two phases with the ultimate goal of achieving zero days over 1.0 deciview of modeled visibility impairment in the Bridger Wilderness Area from the proposed project. If this goal cannot be demonstrated, the Operators, BLM, EPA, and WDEQ would jointly agree to a mitigation plan that complies with the goal, using any and all means available. If technology alone cannot meet this goal, reducing the rate of drilling and development on the PAPA will need to be considered by BLM and the operators. This potential action is included in the Draft SEIS and the EPA strongly supports this measure given the proximity of the proposed development to the Class I Bridger Wilderness Area.

AQ-1

FA-1-3

EPA and the WDEQ also worked closely with BLM to provide early input on the ozone modeling analysis. As noted in the Supplemental Ozone Analysis, elevated ozone levels have been recorded during the winter months at several ambient air monitoring stations neighboring the PAPA. The air quality modeling also predicted elevated levels of ozone in summer months. While the area remains in compliance with National and Wyoming Ambient Air Quality Standards (NAAQS and WAAQS), this issue clearly demands close observation. In order to better understand these predicted ozone levels, the BLM may wish to consider conducting a more refined ozone modeling analysis prior to issuance of the Final SEIS. An analysis using 12 km grid cells rather than the current 36 km grid cells would more accurately depict the geography of the project area, and would provide BLM, the Air Quality Stakeholders, and the public with additional information regarding of potential summertime ozone levels in the project area. In addition, we want to recognize and support the work planned by the WDEQ to address the wintertime ozone exceedances monitored in the field. This is an important effort and will involve a level of intense field work beyond the scope of this Draft SEIS. As mentioned in the Supplemental Ozone Analysis, if future air monitoring continues to show ozone exceedances that are attributable at least in part to sources in the PAPA, BLM will coordinate with the WDEQ and EPA to define a specific adaptive management strategy to mitigate ozone precursor emissions.

EFFECTS ON WILDLIFE

W-1

W-2

FA-1-4

Given the abundant and unique wildlife populations within and around the PAPA, EPA recognizes the significant challenge facing the BLM to proceed with the development of the project while protecting the indigenous and migratory wildlife species. Recognizing the wildlife management expertise of the U.S. Fish and Wildlife Service and the Wyoming Game and Fish Department, EPA encourages BLM to continue to coordinate with these agencies to identify and implement appropriate mitigation measures. EPA also recommends that BLM include and discuss any differences between the project's proposed mitigation measures and those recommended in the Wyoming Game and Fish Department's "Minimum Recommendations for Development of Oil and Gas Resources Within Crucial and Important Wildlife Habitats on BLM Lands"; BLM's National Sage Grouse Habitat Conservation Strategy; and mitigation measures recommended by the U.S. Fish and Wildlife Service.

EPA's RATING

Consistent with Section 309 of the Clean Air Act, it is EPA's responsibility to provide an independent review and evaluation of the potential environmental impacts of this project. EPA is rating this Draft SEIS as Environmental Objections – Inadequate Information (EO-2) because EPA's review of the Draft SEIS has identified reasonably available alternatives which should be considered to mitigate significant impacts to the environment. If a reduced pace of development alternative is not fully analyzed in the Final SEIS, EPA believes a sufficient and more detailed explanation to support this decision should be provided. Along with a rating of EO comes an offer and commitment to work with the BLM in resolving these issues including the consideration of additional alternatives. In addition to EPA's detailed comments on the Draft SEIS, a full description of EPA's EIS rating system is enclosed.

As this project proceeds, we look forward to our continued work with BLM and the Wyoming Department of Environmental Quality to reduce visibility impacts and prevent ozone exceedances. If you have any questions regarding our concerns about the range of alternatives, our detailed comments, or this rating, please me at 303-312-6308 or Larry Svoboda of my staff at 303-312-6004.

Sincerely,

Kerrigan G. Clough /for

Robert E. Roberts
Regional Administrator

Enclosure

cc: John Corra, Wyoming DEQ
Don Simpson, BLM
Dennis Stinger, BLM
Matt Anderson, BLM
Susan Caplan, BLM

Detailed Comments by the Region 8 Environmental Protection Agency for the Draft Supplemental Environmental Impact Statement (SEIS) Pinedale Anticline Oil and Gas Exploration and Development Project Sublette County, Wyoming

Alternatives

AL-4 FA-1-5

Alternatives are the "heart of an environmental impact statement and agencies are required to rigorously explore and objectively evaluate all reasonable alternatives." (40 CFR Part 1502.14). In the Draft SEIS, BLM analyzed two similar action alternatives for development in the PAPA. In order to provide the lead agency and the public with information and analysis of a range of reasonable alternatives, EPA Region 8 recommends the NEPA analysis for this project include full consideration of a Reduced Pace of Development Alternative and a Resource Protection Alternative, or a combination of both. EPA considers these to be reasonable alternatives to the proposed action and they appear to EPA to meet the project purpose as stated on page 1-9 in the Draft SEIS: "The purpose and need of the proposed development is to enable the commercial production of federally owned mineral resources in conformance with the BLM RMP mineral objectives, and to prevent drainage of federal minerals by wells located on adjacent non-federally owned lands."

BLM acknowledges that the Proposed Action and the Preferred Alternatives, while spatially different, consist of the same primary project components of development and production of up to 4,399 additional wells on approximately 12,275 acres of new disturbance by the year 2023. EPA believes a Reduced Pace of Development Alternative would provide important information on the magnitude of potential environmental impacts associated with the development of the proposed number of wells over a longer time period. There is debate over whether the environmental impacts associated with developing intensely over a shorter time period are more severe or less severe than developing less intensely over a longer period of time. There is also uncertainly as to what types of mitigation and reclamation measures would be most effective under the different rate of development scenarios. EPA believes all of this information is important to analyze, describe, and consider in deciding how best to proceed with the proposed project in consideration of the multiple uses and values for this project area.

AL-5 FA-1-6

In Chapter 2, BLM considered but declined to fully analyze a Reduced Pace of Development Alternative for several reasons. First, BLM stated "the No Action Alternative has the elements of a reduced pace of development, due to the seasonal wildlife stipulations." NEPA requires analysis of a No Action Alternative in order to establish an environmental impacts baseline for comparison with the Proposed Action. The No Action Alternative for this project does not include the proposed additional natural gas development, nor does it provide information on impacts to all resources associated with the different rate of additional well development scenarios. Thus, the No Action Alternative is distinct from a Reduced Pace of Development Alternative and should not be considered equivalent. BLM also indicates a Reduced Pace of Development Alternative was not fully considered because it would increase the overall period for development. This rationale appears to EPA to assume that an increase in

FA-1-6

the overall period for development would be unreasonable but lacks the supporting analysis for this conclusion. Finally, the Draft SEIS states that analyzing a Reduced Pace of Development would not be in keeping with the Energy Policy Act of 2005. EPA notes the Energy Policy Act directs expeditious *compliance* with NEPA and in that sense would not appear to provide a basis to eliminate from NEPA analysis, a reasonable alternative to the Proposed Action.

FA-1-7

AL-6

Both action alternatives also include a relaxation of seasonal wildlife stipulations in big game crucial winter range and in sage grouse seasonal habitats. Drilling and completions within these habitats would occur year-round within concentrated development areas centered in a core area on the Anticline Crest. BLM briefly considered but declined to fully analyze a Conservation Alternative that would require implementation of all seasonal wildlife restrictions with no exceptions and additional mitigation. BLM declined to fully analyze this alternative for various reasons, including: it may be difficult for operators to acquire Tier 2 equivalent drilling rigs; the potential need for more than four well pads per section; all completions may not be able to be "green" because of safety issues; and it may be unreasonable to require operators be connected to the liquids gathering system for all locations. EPA acknowledges these challenges. EPA believes, however, that a Conservation Alternative can be developed that incorporates some degree of flexibility to provide for these uncertainties as was done in the existing ROD (see discussion in Table 3 on well pad density and centralized production facilities (CPF) in the 2000 ROD. These reasons alone do not appear to render a Conservation Alternative unreasonable.

FA-1-8

AL-7

EPA also notes BLM considered and ultimately implemented a Resource Protection Alternative with the 2000 Pinedale Anticline ROD because it "incorporates restrictions and mitigative measures in consideration of the need to prevent unnecessary or undue degradation of important and sensitive resources and human values." (ROD, 2000). The ROD acknowledges the PAPA "as one which has been relatively undisturbed by development for natural gas and that there are important and highly sensitive natural resources and human values within or adjacent to the area which require consideration and protection from unnecessary or undue degradation (FLPMA, Section 302)" (ROD, 2000). Further, the ROD states "The Resource Protection Alternative on Federal Lands and Minerals will provide for the management of the PAPA in a manner that allows for natural gas exploration and development while continuing to provide for the existing principal and major uses recognized by the land use plan for this area (e.g. domestic livestock grazing; fish and wildlife habitat protection, utilization and development; mineral exploration and production; utility and road rights-of-way; visual resource protection; outdoor recreation)." Considering the statements contained in the 2000 ROD about the substantive need for resource protection measures and considering the subsequent studies on wildlife impacts since the ROD, EPA recommends BLM consider full analysis of a Resource Protection Alternative or provide a sufficient and detailed explanation as to why such an alternative would be deemed unreasonable. This analysis would provide the BLM and the public with important information regarding potential environmental impacts, including wildlife, and mitigation associated with this proposed action.

The PAPA is unique in that it is located at the foot of the Bridger Wilderness Area, a Class I area which is afforded special protections under the Clean Air Act. EPA believes that the desire for fast paced energy development should be balanced against the environmental impacts

resulting from development in an area with important and highly sensitive natural resources and human values that warrant consideration and protection from unnecessary or undue degradation. There are some areas that have multiple uses where a reduced paced development or no development should be considered viable alternatives to full paced development. This is particularly important for an area such as the Pinedale Anticline, with its predicted impacts to the Bridger Class I Wilderness Area, and consistent with Part 3160 On Shore Oil and Gas Operations which provides for BLM to ensure "all operations be conducted in a manner which protects other natural resources and the environmental quality"(43 CFR 3161.2).

AL-8 FA-1-9 Given the considerations detailed above, and the potential impacts to the environment and wildlife which may be mitigated with a Resource Protection Alternative and a Reduced Rate of Development Alternative, or some combination of the two, EPA recommends BLM broaden the alternatives selected for full analysis. EPA reiterates its willingness and commitment to work with the BLM in resolving these issues.

No Action Alternative

FA-1-10 AL-9 NEPA requires analysis of a No Action Alternative in order to establish an environmental impacts baseline for comparison with the Proposed Action. In the Draft SEIS, BLM analyzes the No Action Alternative in terms of continuing with the present course of action until that action is changed, (i.e. approving wells under the 2000 ROD until approval of a new ROD). The Draft SEIS states there is "uncertainty" with regard to the 2000 ROD. Any uncertainty is resolved by examining the extent of the development actually analyzed in the Pinedale Anticline Oil and Gas Exploration and Development Project EIS, that is, impacts associated with the development of 700 producing natural gas wells over a 10 to 15 year time period. EPA believes that this scenario should be the basis for the No Action Alternative rather than the No Action Alternative considered in the Draft SEIS which includes the development of an additional 1,139 wells for a total of approximately 1,800 wells by the year 2011. EPA recommends the No Action Alternative and baseline analysis be revised to accurately reflect the 700 producing well scenario analyzed in the initial Pinedale Anticline EIS and implemented in the 2000 ROD.

Air Quality - Visibility

The Clean Air Act requires special protection of air quality and air quality related values (such as visibility) in many of the nation's wilderness areas and national parks. Subpart II of Part C of the Clean Air Act prescribes a program specifically for the protection of visibility in federal Class I areas and establishes "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." EPA's implementing regulations require states to submit implementation plans that contain such measures as are necessary to make reasonable progress towards the national requirements, and that states establish reasonable progress goals toward improving visibility on the worst days and preventing further degradation in visibility during the best days. Actions by BLM that lack adequate mitigation of potential visibility impacts could

impede Wyoming's ability to submit a State Implementation Plan that meets the Clean Air Act requirements.

In addition to its visibility provisions, the Clean Air Act contains general provisions for a Prevention of Significant Deterioration (PSD) program designed to protect federal Class I areas from air quality degradation under Subpart I of Part C. The PSD program places an affirmative responsibility on federal land managers to protect air quality in many of the most important national parks and wilderness areas in the nation from human-caused pollution. The Wilderness Act further directs the federal land management agencies to protect the wilderness character of those areas designated as wilderness. In that Act, Congress recognized the importance of preserving designated areas in their natural condition and declared a policy to "secure for the American people of present and future generations the benefits of an enduring resource of wilderness."

As stated on page 4-66 of the Draft SEIS, "BLM considers a 1.0 deciview (dv) change to be a significance threshold for visibility impairment," which is consistent with other federal agencies' approach to visibility protection. Pursuant to the Clean Air Act and other provisions of law, EPA and the federal land managers have developed regulations, guidance, and technical tools including models and data that land managers can use to help protect air quality in federal Class I areas. One of these is a guidance document from the Federal Land Managers' Air Quality Related Values Workgroup (FLAG), a workgroup that the federal land managers formed to develop a more consistent approach to evaluate air pollution effects on the areas that they manage. The FLAG guidance document states that impacts greater than 1.0 dv would be considered perceptible and significant for new source review purposes, and EPA supports efforts by the Federal Land Managers to coordinate and streamline their participation in permitting. EPA has not adopted the 1.0 dv threshold into rules governing the requirements for federal or state New Source Review programs.

The Draft SEIS includes analysis of modeled visibility impacts for both the current level of development in 2005 and the proposed project development through 2023. In Chapter 3.11.2 of the Draft SEIS, BLM discusses the visibility analysis conducted for the year 2005 and discloses the impacts of development that have occurred since BLM's 2000 Pinedale Anticline ROD. This analysis was conducted because the level of development since 2000 led to emissions that exceeded those analyzed in the earlier EIS, triggering additional analysis under the 2000 Pinedale Anticline ROD. The visibility modeling analysis for the 2005 level of development predicts 45 days per year of visibility change greater than the 1.0 dv threshold at the Bridger Wilderness Area, five days per year at the Fitzpatrick Wilderness Area, and additional days at other regional Class I and sensitive Class II areas.

In Chapter 4.9.3.4 of the Draft SEIS, BLM discloses the potential future effects of the Preferred Alternative (Alternative C). BLM analyzed potential effects of emissions controlled with phase I mitigation (equivalent to 2005 actual emissions but with a geographic configuration of sources assumed to exist in the future) and effects of emissions controlled with phase II mitigation (controlling emissions from drilling rigs by additional reductions up to 80 percent). This analysis finds that, for the Preferred Alternative with phase I mitigation, the potential for

visibility impairment is 40 days per year above the 1.0 dv threshold at the Bridger Wilderness Area, five days at the Fitzpatrick Wilderness Area, and additional days in other areas. These effects are similar to those modeled for 2005 as described above, and are less than the modeled effects of the current No Action Alternative (62 days per year over 1.0 dv at the Bridger Wilderness Area), and are also less than those of the proposed action (67 days per year at Bridger Wilderness Area). This current level of potential impairment would be the starting point for phase II mitigation.

Phase II mitigation would begin immediately after phase I and includes modeling a 20 percent drilling rig emission reduction each year for the next four years. Impacts would be reduced to 35 days, 23 days, and 17 days of potential visibility impairment over 1.0 dv at Bridger Wilderness Area during the next three years, respectively. In the fourth year, potential effects on visibility of BLM's Preferred Alternative with phase II mitigation would include ten days per year above the 1.0 dv threshold at the Bridger Wilderness Area and one day per year at the Fitzpatrick Wilderness Area, the Gros Ventre Wilderness Area, and the Wind River Roadless Area. Section 4.9.5 of the Draft SEIS explains the mitigation scenarios for visibility impacts. As stated in this section, the ultimate goal of phase II mitigation is zero days of impairment greater than 1.0 dv. Experience in the Pinedale Anticline[1] and Jonah field suggests that this is a reasonable goal.

As stated in the same section of the Draft SEIS, if modeling cannot demonstrate achievement of this goal within five years of the ROD being signed, "the Operators, BLM, EPA, and WDEQ would jointly agree to a mitigation plan that complies with the goal, using any and all available means." The stakeholders will consider any reasonable mitigation approach, such as those listed in Chapter 4.9.5, and including reducing the rate of drilling and development. This potential action is included in the Draft SEIS and the EPA strongly supports this measure given the close proximity of the proposed development to the Class I Bridger Wilderness Area. Furthermore, the Air Quality Task Group (of the Pinedale Anticline Working Group) in its 2005 report expressed concerns that, while monitoring of visibility using the IMPROVE protocol at the Bridger Wilderness Area is representative of that Class I area, "In terms of evaluating impacts to visibility from local development, modeling suggests that the existing Bridger IMPROVE station is not, by itself, located to effectively capture potential impacts." We encourage BLM to use information from the Draft SEIS to craft a Record of Decision that mitigates the impact of emissions from the Pinedale Anticline and protects visibility in Class I and sensitive Class II areas. EPA also encourages BLM to work with the Wyoming Department of Environmental Quality, Air Quality Division (WDEQ-AQD) to ensure that visibility monitoring in the region adequately represents impacts of the project, such as by further enhancing the aerosol monitoring being added by the WDEQ-AQD at South Pass.

FA-1-11

AQ-3 AQ-2

[1] For example, the "Technology Demonstration Report – Selective Catalytic Reduction and Bi-Fuels Implementation on Drill Rig Emissions, Final," ENSR, June 16, 2006, Document No 05977-010-400.

Air Quality – Supplemental Ozone Analysis

A change occurred in plans for the ozone impact analysis while BLM was developing the modeling protocol for the Pinedale Anticline Oil and Gas Exploration and Development Project. As stated in the Draft SEIS, the analysis originally planned to estimate potential ozone impacts with a screening method (see Section 4.9.3.1, page 4-62). The intended screening method involved a relationship between emissions of volatile organic compounds (VOC) and emissions of oxides of nitrogen (NO_x) known as VOC/NO_x screening tables or "the Scheffe method." During planning, however, concern about the VOC/NO_x screening tables emerged. EPA Region 8 joined the other stakeholders in a consensus to use the CALGRID model for the ozone analysis in this case. BLM released the results of the Supplemental Ozone Analysis in February 2007.

AQ-4 FA-1-12

The Supplemental Ozone Analysis, under Environmental Consequences, shows concentrations over 80 parts per billion estimated by the analysis but not a violation of the eight-hour ozone standard. In order to better understand these predicted ozone levels, the BLM may wish to consider conducting a more refined ozone modeling analysis prior to issuance of the Final SEIS. An analysis using 12 km grid cells rather than the current 36 km grid cells would more accurately depict the geography of the project area, and would provide BLM, the Air Quality Stakeholders, and the public with additional information regarding potential summertime ozone levels in the project area. We also recommend BLM proceed with caution to the Final SEIS and the ROD due to extenuating factors as explained in the following paragraphs.

AQ-5 AQ-6 FA-1-13

EPA recommends that BLM acknowledge uncertainty exists regarding ozone formation in the area and the Wyoming Department of Environmental Quality, Air Quality Division (WDEQ-AQD) is studying the problem. The WDEQ-AQD is working on a field project to investigate the causes of high ozone concentrations near the project area. EPA believes that BLM should take into account that this study might shed light on the role of emissions from oil and gas development in ozone formation. In addition, as recognized in the Supplemental Analysis, the high ozone concentrations shown by air monitoring have occurred in winter, while the available regulatory models typically predict high concentrations in summer.

Finally, BLM assumed that the Preferred Alternative (Alternative C) would include mitigation primarily of NO_x emissions. Table 2.1 of the Supplemental compares emissions between 2005 (a year when air monitoring actually showed ozone concentrations over 80 ppb) and a future year of Alternative C, phase II. During this period, NO_x emissions from the project area would decrease by approximately 44 percent while VOC emissions would decrease by approximately 14 percent. These decreases would tend to decrease the overall ozone-forming potential of emissions from the Pinedale Anticline. Because the modeling analysis shows only cumulative results, however, it is not possible to quantify a decrease in ozone concentrations caused by this decrease in emissions.

Accordingly, EPA recommends that BLM include material in the Final SEIS and ROD to ensure that adaptive management will be implemented in the event that monitoring or modeling show emissions from the Pinedale Anticline contribute to high ozone concentrations in the area.

Wildlife

Since issuance of the 2000 Pinedale Anticline ROD, several wildlife studies have been conducted in the Pinedale Anticline area and the results of those studies are disclosed in Chapters 3 and 4 of the Draft SEIS. The studies found:

- The population of mule deer in the Sublette Herd Unit steadily declined by approximately 40% between 2002 and 2005-2006 (Sawyer et al., 2005a) (Page 4-131, Draft SEIS).

- The Sublette Herd Unit moose post season population declined by 32% from 1999 to 2005 (WGFD) (Page 3-113, Draft SEIS).

- Male counts on sage grouse leks that were heavily impacted by gas wells declined 51 percent from 1 year prior to well development in 1999 through 2004 (Holloran 2005) (Page 3-117, Draft SEIS). Further, results of the long-term study on effects of wellfield development to greater sage-grouse lek attendance indicate that the 0.25 mile buffer surrounding leks, within which surface disturbance would be avoided (PAPA ROD), is insufficient to maintain function of lek habitats due to wellfield activities and associated noise (Holloran, 2005 and Ecosystem Research Group, 2006) (Page 4-134, Draft SEIS).

W-2 AL-10 W-3 FA-1-15

Given the results of these and other wildlife studies in the area, EPA encourages BLM to continue to coordinate with the U.S. Fish and Wildlife Service and the Wyoming Game and Fish Department to identify and implement appropriate mitigation measures in the Final SEIS and ROD. As discussed above, EPA also supports full analysis of a Resource Protection Alternative for this project. EPA also recommends that BLM include and discuss any differences between the project's proposed mitigation measures and those recommended in the Wyoming Game and Fish Department's "Minimum Recommendations for Development of Oil and Gas Resources Within Crucial and Important Wildlife Habitats on BLM Lands"; BLM's National Sage Grouse Habitat Conservation Strategy; and mitigation measures recommended by the U.S. Fish and Wildlife Service.

W-4 FA-1-16

The 2000 Pinedale Anticline ROD indicates that "No information is currently available to suggest that waiving or modifying the seasonal constraints in the project area would not be detrimental to the resources the seasonal restrictions are intended to protect." Since issuance of the ROD, BLM has granted several exceptions to the seasonal restrictions and allowed year round drilling. If BLM has analyzed the impact to wildlife from these exceptions, EPA recommends the analyses be included in the Final SEIS along with any additional information that has been developed since 2000 that would support year round drilling.

Surface Water, Water Quality, and Aquatic Habitat

FA-1-17 SW-1

In the Draft SEIS's executive summary, it is acknowledged that sediment yields will be substantially increased above current conditions in six hydrologic sub-watersheds that coincide with the Anticline Crest. This conclusion is substantiated by the *Erosion Modeling, Sediment Transport Modeling and Salt Loading Technical Report* prepared by HydroGEO and presented in Table 4.14-4. According to the model, the average annual sediment yield would increase by 73% in the New Fork River – Alkali Creek, 102% in Mack Reservoir and 26% in the Sand Draw-Alkali Creek sub-watersheds in 2023 (under the worst case modeling scenario with no reclamation). Yet, Chapter 4.14 concludes these substantial increases in sediment yield are not expected to result in "significant" impact to surface water resources under any of the alternatives. It appears this conclusion is reached based on a finding that the increased sediment loading, although substantial, would not impair the designated uses for these waters. The Draft SEIS does not clearly explain the basis for this conclusion. EPA suggests the Final SEIS clarify how the projected increased sediment yields are translated into projected compliance with Wyoming's narrative water quality standard for settleable solids, which states:

> "In all Wyoming surface waters, substances attributable to or influenced by the activities of man that will settle to form sludge, bank or bottom deposits shall not be present in quantities which could result in significant aesthetic degradation, significant degradation of habitat for aquatic life or adversely affect public waters supplies, agricultural or industrial water use, plant life or wildlife."

FA-1-18 SW-2

It is also clear from the Draft SEIS that avoiding adverse effects to the designated uses will rely on "extensive" use of Best Management Practices (BMPs) to prevent erosion, as well as timely reclamation. To ensure adverse effects to surface water quality are avoided, EPA recommends the Final SEIS identify: 1) the target and the threshold of change from the target being used to determine compliance with the designated uses assigned to these waters; and 2) the level of effectiveness for the applicable BMPs; 3) and the process that will be used to ensure effective implementation and maintenance of those BMPs (i.e., monitoring of effectiveness and implementation enforcement). EPA suggests this information be linked to the Performance-Based Objectives included in Appendix E of the Draft SEIS.

FA-1-19 AH-1 AH-2

The Draft SEIS notes that a number of waters within the Anticline Crest are prime sport fisheries. Measures of impact to these aquatic communities from increased sediment yield could be based on either change in biological condition or change in bedded sediments (% fines). The Draft SEIS notes that a report by EcoAnalysts, Inc. (2005) concluded "... there has been no discernable change in ... invertebrate biology indices in 5 years up to the time." EPA recommends the Final SEIS provide more detail about this analysis as well as the general approach to and results of the monitoring conducted by the SCCD. For example, is the biological monitoring approach used similar to, or consistent with, the Wyoming DEQ's bioassessment protocol? [see: Wyoming DEQ's *Redevelopment of the Wyoming Stream Integrity Index (WSII) for Assessing the Biological Condition of Wadeable Streams in Wyoming*]. At a minimum, EPA recommends the discussion should include information about the biological metrics or index used, the basis for their derivation and application, and level of precision by

AH-2 F-1-19 which these analyses are able to define thresholds that would avoid "significant degradation of habitat for aquatic life" under Wyoming's narrative standard.

AH-3 FA-1-20 Once a target and threshold of change from the target have been identified, EPA recommends BLM implement a comprehensive water monitoring plan to ensure the BMPs and Performance-Based Objectives are successfully mitigating the impacts from increased sedimentation and the identified target is being met. At a minimum, we recommend that BLM establish a monitoring program in the most sensitive watersheds and the watersheds most likely to be impacted.

SW-3 FA-1-21 In the 2000 Pinedale Anticline ROD, BLM committed to implementing a monitoring program to ensure that the Green and New Fork Rivers continue to support their designated uses. Yet, the Draft SEIS indicates that it is not known if significant impact has occurred to surface water. EPA recommends BLM include a discussion of the surface monitoring program, any obstacles in implementing the program, and any monitored results in the Final SEIS.

Performance-Based Objectives and Adaptive Management (Appendix E)

PBO-1 FA-1-22 BLM's Preferred Alternative, Alternative C, includes a series of Performance-Based Objectives which are designed to mitigate impacts associated with development and to encourage timely remediation. Adaptive management and Performance-Based Objectives can be important tools in mitigating and minimizing impacts to the environment. However for these tools to be effective, it is important that the management strategy and framework be clearly identified at the onset. While BLM identifies a series of objectives and monitoring methods, EPA recommends this section be clarified in the Final SEIS to include:

- The intended outcome. The Performance-Based Objectives should be linked to a clear goal. When will the reclamation be considered a success and how will this be measured? BLM has identified the reclamation monitoring methods, but it appears unclear how success will be determined.

- A monitoring timeframe. EPA recommends that the performance strategy identify a monitoring timeframe, including when the monitoring will occur, how often, and by whom

- Funding. EPA believes that funding to implement the Performance-Based Objectives is also critical.

EPA also recommends the Final SEIS describe consequences and action triggers should an objective fail to be met; and how BLM will document the progress and report to stakeholders.

AM-1 FA-1-23 In addition, the Final SEIS should report on the progress of the Adaptive Environmental Management program that was included in the 2000 Pinedale Anticline ROD. If BLM met obstacles in implementing the Adaptive Environmental Management program, EPA suggests the

AM-1 FA-1-23 Final SEIS detail how these obstacles will be addressed and overcome with the future implementation of the Performance-Based Objectives.

Wetlands – Wetlands, Riparian Resources and Flood Plains

WT-2, WT-1 FA-1-24 The Draft SEIS does not appear to determine clearly the extent or duration of impacts to wetlands or riparian habitat within the PAPA due to oil and gas development for the life of the projected project ending in 2023. As shown in Table 3.20-1, there were approximately 13,482 acres of existing wetlands within the PAPA before 2000. The Draft SEIS, however, does not break down what type of wetlands or their acreage that existed in the PAPA other than with broad statements such as floodplain wetlands and irrigated agricultural fields. EPA believes this detailed information is important to understand the long term trends of wetland losses and conversions to different wetland types in order to further understand the impacts occurring to the aquatic ecosystems within the PAPA. EPA recommends the Final SEIS clearly describe and show the location, type and acreage of wetlands within the PAPA. This evaluation could be accomplished using aerial photography, soil surveys if available, and USFWS National Wetland Inventory mapping. In addition, EPA recommends this analysis include wetlands and riparian habitats occurring outside of the PAPA that may be impacted by activities undertaken within the PAPA during oil and gas development (e.g., sedimentation impacts, construction of supporting infrastructure and employee housing).

Wetlands – Section 404 of the Clean Water Act and Executive Order 11990, Protection of Wetlands

Clean Water Act (CWA) Section 404 regulates discharge of dredged or fill material into "waters of the United States," including certain wetlands. Under CWA Section 404, permits for such discharges are generally issued by the U.S. Army Corps of Engineers, in accordance with EPA's CWA Section 404(b)(1) guidelines. These guidelines require, among other things, that no discharge of dredged or fill material shall be permitted unless appropriate and practicable steps have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem (40 CFR 230.10(d). In addition, Executive Order 11990 – Protection of Wetlands (May 24, 1977) states in pertinent part as follow: "Section 1. (a) Each agency shall provide leadership and shall take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities for (1) acquiring, managing, and disposing of Federal lands and facilities; and (2) providing Federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities. (b) This Order does not apply to the issuance by Federal agencies of permits, licenses, or allocations to private parties for activities involving wetlands on non-Federal property."

FA-1-25 In reviewing the Draft SEIS, EPA has been unable to find a reference to wetland or stream mitigation or other approaches developed to offset direct and indirect impacts and

WT-4 WT-3 FA-1-25 disturbances to wetlands, streams or riparian habitats that have occurred to date or will occur in the future. In conversations with U.S. Army Corps of Engineers (Corps) wetland regulatory staff, EPA learned that no Section 404 Individual permits and few Section 404 Nationwide permits have been issued for actions within the PAPA. However, the Draft SEIS indicates 150 acres of wetlands have been disturbed to date by gas and oil development. EPA recommends that the Final SEIS discuss BLM's approach to implementing federal wetland policies and legal requirements in the continued development of the PAPA. In addition, EPA recommends the Final SEIS clearly explain how BLM will be mitigating the loss and disturbance of wetlands and streams within and adjacent to the PAPA.

Wetlands – Cumulative Impacts to Wetlands, Streams and Riparian Corridors

WT-5 FA-1-26 As stated in the Draft SEIS on page 3-95, "Because of agricultural and residential development on private lands, the total areas affected by various human-related disturbances to wetlands and the Wetland Sensitive Resource Zone Management (SRZM) before approval of the PAPA ROD (BLM, 2000b) is quite extensive." To accurately address cumulative wetland impacts and the health of the New Fork and Green River watersheds, EPA recommends the Final SEIS identify approximately how many acres of wetlands were affected prior to 2000. This would provide an estimate of the total amount of wetlands disturbed to date and enable BLM to evaluate the effects of future projected losses of aquatic resources and identify when they can no longer provide the functions needed to assure a healthy watershed (e.g. decline in water quality, flood protection, wildlife habitat).

WT-6 FA-1-27 Table 3.20-1 identifies 13,482 acres of wetlands that occur within the PAPA. EPA is unclear if this acreage existed prior to oil and gas exploration in 2000 or is the estimate of wetlands that existed prior to any human disturbance within the PAPA. EPA suggests the Final SEIS provide clarification of this table.

WT-7 FA-1-28 The Final SEIS should state the percent of total wetland disturbance by 2023 in the PAPA. This could be done by using Table 4.18-2. The following is EPA's estimate using figures found in the Draft SEIS:

No Action 2011	14.7%	wetland disturbance
Proposed Action 2011	14.7%	wetland disturbance
Alternative C 2011	15.0%	wetland disturbance
Proposed Action 2023	16.7%	wetland disturbance
Alternative C 2023	16.5%	wetland disturbance

It should be noted that the disturbance of approximately 15% of the historic wetlands in a watershed has been used as a threshold for when a watershed can no longer provide the needed function to protect water quality, flooding and wildlife diversity.[2]

Greenhouse Gas Emissions

AQ-8 FA-1-29 In Chapter 4.9, the Draft SEIS indicates the project will emit greenhouse gases from several sources. While not to suggest that there is an inadequacy in the NEPA document on this issue, we recommend the Final SEIS encourage the project developers to participate in EPA's Natural Gas STAR. Through the GasSTAR Program (www.epa.gov/gasstar), EPA works with companies that produce, process, transmit and distribute natural gas to identify and promote the implementation of cost-effective technologies and practices to reduce emissions of methane, a potent greenhouse gas.

Additional Detailed Comments

PA-1 FA-1-30 Chapter 2 Alternatives, Page 2-25: Under the Proposed Action, the Operators would drill delineation wells within the first 5 years to assess production capabilities and ultimate well density required to develop their leases, both within and outside the core area. Where possible, the delineation wells would be drilled in accordance with all seasonal stipulations. However, there may be exceptions. Have the Operators identified the number and location of delineation wells that are necessary? If so, EPA suggests this information be included in the Final SEIS.

PA-2 FA-1-31 Chapter 2 Alternatives, Page 2-33: Under BLM's Preferred Alternative, development activities would not be able to advance to the north of Development Area 1 (DA-1) until the southern initial development is completed and final reclamation measures have been initiated. Given the potential impacts to wildlife, EPA suggests BLM consider advancement north only after full site restoration and reclamation has been completed and is deemed adequate.

AQ-9 FA-1-32 Chapter 2 Compressor Stations, Page 2-10: The Draft SEIS acknowledges that the total NO_x emission of 472.2 tpy is over the 376.59 tpy NO_x analysis threshold specified in the 2000 Pinedale Anticline ROD. However, the current compression level of nearly 60,000 hp is within the amount of compression analyzed in the PAPA DEIS (26,000 to 96,000 hp). EPA recommends BLM review the analysis that was contained in the DEIS to understand why the compression emissions were underestimated and to ensure that the NO_x will not be underestimated in this new analysis.

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[2] Brabec, Elizabeth, Stacey Schulte, and Paul L. Richards. Impervious Surfaces and Water Quality: A Review of Current Literature and Its Implications for Watershed Planning. Journal of Planning Literature, Vol. 16, No. 4 (May 2002).

AQ-10 FA-1-33 Chapter 3 Air Quality, Page 3-62: As disclosed in Section 3.11.2, near-field modeling for 2005 showed potential PM_{10} concentrations above 30 $\mu g/m^3$ (see Table 3.11-5). The near-field, 24-hour PM_{10} concentration of 74.2 $\mu g/m^3$ modeled for the proposed action also is greater than 30 $\mu g/m^3$ (see Table M-4). Although these modeled concentrations are greater than the level of the Class II increment, this analysis does not constitute a regulatory PSD increment consumption analysis, and BLM may have concerns about the accuracy of short-term modeling of PM_{10} in the near field. Table M-15 shows in-field concentrations of PM_{10} under Alternative C, with mitigation, that are lower than concentrations under the No Action Alternative, but (unlike the results for NO_2) higher than concentrations under the Proposed Action. EPA recommends the Final SEIS expand this section, incorporating at least a brief explanation of the likely effects of mitigation on near-field and in-field results for PM_{10}.

AQ-11 FA-1-34 Chapter 3 Air Quality, Page 3-64: The footnote on modeled ambient concentrations of criteria pollutants is missing from Table 3.11-5. Please restore this footnote in the Final SEIS.

AQ-12 FA-1-35 Chapter 4 Air Quality, Page 4-64: Section 4.9.3.1 of the Draft SEIS refers the reader to Appendix M for information on the near-field analysis of concentrations, relative to PSD increments. Table M-1 refers to the NO_2 increment in its title and shows the increment in a column, but tables M-3 (SO_2 concentrations) and M-4 (PM_{10} concentrations) do not refer to or show increments. On the other hand, the in-field results (viz., table M-15) include the Class II increments for NO_2, SO_2, and PM_{10}. Tables M-26, M-27, and M-28 compare concentrations modeled at sensitive receptors in the far field to Class I and Class II increments. Please add the increments to Tables M-3 or M-4 or clarify whether BLM intentionally refers the reader only to the in-field and far-field results for SO_2 and PM_{10} increments.

AQ-13 FA-1-36 Chapter 4 Air Quality: Section 4.9.3.4 discloses the potential near-field effect of Alternative C on the NO_2 Class II increment as potentially "similar to the Proposed Action Alternative results." This corresponds to a maximum annual concentration of 34.5 $\mu g/m^3$ of NO_2, which is greater than 25 $\mu g/m^3$. The Draft SEIS also discloses that maximum near-field concentrations of NO_2 modeled for the No Action Alternative (see Section 4.9.3.2) and the year 2005 (see Table 3.11-5) are greater than 25 $\mu g/m^3$. Although these modeled concentrations are greater than the level of the Class II increment, EPA acknowledges that the modeling does not constitute a regulatory PSD increment consumption analysis. Furthermore, the Wyoming Department of Environmental Quality, Air Quality Division conducted an actual increment consumption analysis for NO_2 in the area. Their analysis used 2004 emissions in Sublette County and resulted in maximum concentrations below the increments in both Class I and Class II areas. Together with the information presented in the Draft SEIS, the State's analysis suggests it is unlikely that Alternative C would jeopardize the NO_2 increment. Nevertheless, EPA recommends the Final SEIS disclose, at least qualitatively, what effect the mitigation in phases I and II might have on ambient concentrations of NO_2. For instance, modeling results for BLM's Preferred Alternative, Alternative C, indicate that reducing emissions would also mitigate in-field concentrations of NO_2 (see Table M-15).

AQ-14 FA-1-37 Appendix M Air Quality Impact Tables Year 2005 Modeling: Tables M-4 and M-5 show near-field PM_{10} and $PM_{2.5}$ concentrations. The maximum 24-hour concentrations are the same as the highest concentrations shown in Table 3.3 of the Air Quality Technical Support Document (TSD), that is, the concentrations under the configuration labeled "20-acre well pad, 4 well pads per section." The maximum annual concentrations in the two tables in Appendix M (1.7 $\mu g/m^3$ for both PM_{10} and $PM_{2.5}$) correspond to the configuration "1 drill rig per well pad/4 drill rigs per section, tier 1 emissions." This is not the configuration showing the highest annual concentrations of particulate matter in Table 3.3 of the TSD (the maximum is 2.1 $\mu g/m^3$ under "2 drill rigs per well pad/4 drill rigs per section, tier 1 emissions"). EPA recommends BLM clarify how the data shown in tables M-4 and M-5 were selected.

AQ-15 FA-1-38 Air Quality Technical Support Document: EPA also suggests BLM clarify the relationship of concentrations shown in Table 3.3 of the TSD. In each case, modeled annual concentrations of PM_{10} and $PM_{2.5}$ are identical, while PM_{10} and $PM_{2.5}$ differ on the 24-hour basis. The estimates of PM_{10} and $PM_{2.5}$ emissions from drilling rigs (i.e., diesel particulate) in Table 2.1 of the TSD are the same, but the same table shows PM_{10} emissions from fugitive sources that are greater than the $PM_{2.5}$ emissions by a factor of approximately five. EPA recommends BLM provide an interpretation of why, in the near field, the modeled annual concentrations of PM_{10} never exceed the annual concentrations of $PM_{2.5}$.

AQ-16 F-1-39 Air Quality Technical Support Document: In Table 3.7 of the TSD, please revise the values shown in the column under reference exposure levels or concentrations immediately dangerous to life or health (IDLH) for ethylbenzene and n-hexane. The numbers shown are reported as IDLH divided by ten, but they are actually IDLH divided by 100. In Table 3.8 of the TSD, please revise the reference concentration (RfC) for chronic inhalation of xylene from 430 to 100 $\mu g/m^3$. Appendix M, Table M-6 shows the correct IDLH and RfC value.

AQ-17 FA-1-40 Chapter 4 Air Quality, Page 4-75: EPA suggests BLM make available to the public the annual air quality modeling developed by the Operators and include an annual report to stakeholders and the general public on their progress on the air quality mitigation.

S-1 FA-1-41 Chapter 3 Soils, Page 3-86: To protect the sensitive soils in the Blue Rim Area, EPA recommends BLM consider aligning the pipeline corridor with existing roads as much as possible. As indicated in the Draft SEIS, the high runoff rates and shallow soil depths may limit the reclamation potential of this area.

G-1 FA-1-42 Chapter 4 General: For each of the impacts analyzed, please clarify the cumulative impact analysis area. In particular, does the cumulative impact analysis for wildlife include impacts from the adjacent Jonah Field Project Area?

T-1 FA-1-43 Chapter 4 Transportation, Page 4-35: The text indicates that the vehicular traffic related to drilling and completions during winter would be substantially greater through 2011 under the Proposed Action Alternative compared to traffic under the No Action Alternative. This does not appear to be reflected, however, in the data displayed in Table 4.4-2 Projected Traffic Volume in the PAPA during Development for all Alternatives in Winter 2009. Please clarify the tables and traffic predictions in the Final SEIS.

SW-1 FA-1-44 Chapter 4 Surface Water Page 4-87: To reduce direct impacts to Colorado River endangered fish species as a result of surface water withdrawal, EPA suggests BLM explore using groundwater for pipeline testing and dust control rather than surface water.

W-5 FA-1-45 Chapter 4 Wildlife and Aquatic Resources, Page 4-141: As all of Development Area 5 (DA-5) is within 2 miles of a greater sage-grouse lek, drilling and completions in this development area would comply with the stipulations to protect greater sage-grouse leks and nesting habitat. DA-5 is also in close proximity to the Jonah Field Project Area and shares a common boundary. Given this proximity, EPA recommends the Final SEIS include discussion of sage grouse stipulations implemented in Jonah Field.