

## EXECUTIVE SUMMARY

### Introduction

Jonah Energy LLC (Jonah Energy) submitted a proposal to the United States (U.S.) Department of the Interior (DOI), Bureau of Land Management (BLM) to continue and expand natural gas development operations on its Federal leases within a portion of Sublette County, Wyoming. The BLM determined that Jonah Energy's proposed Normally Pressured Lance Natural Gas Development Project (NPL Project) constitutes a major federal action requiring preparation of an Environmental Impact Statement (EIS). In compliance with the National Environmental Policy Act (NEPA) of 1969, as amended, the BLM, prepared this EIS to analyze and disclose potential effects from the Proposed Action, No Action Alternative, and other developed alternatives.

The proposed NPL Project is located in Sublette County, Wyoming, approximately 35 miles south of Pinedale (Map 1). The Project Area is bordered to the north by two large-scale oil and gas development projects including the Jonah Infill Development Project to the northeast and the Pinedale Anticline Project to the north. The Project Area encompasses 140,859 acres, including approximately 135,655 acres of BLM-administered surface land (96.3 percent) under the jurisdiction of the BLM Pinedale Field Office (PFO) and Rock Springs Field Office (RSFO), 5,123 acres of land administered by the State of Wyoming (3.6 percent), and 81 acres of private lands (0.06 percent). The BLM administers approximately 132,461 acres of Federal mineral estate in the Project Area.

Existing development in the Project Area includes 55 producing natural gas wells and associated infrastructure, roads, electric transmission lines, stock water wells, and other range improvements (Map 3). In total, surface disturbance from existing development encompasses approximately 1,573 acres (1.1 percent) of the Project Area.

The Proposed Action includes drilling up to 3,500 directionally drilled natural gas wells during a 10-year development period at a rate of up to 350 wells per year. Jonah Energy anticipates drilling at an average well density of one bottom-hole per 40 acres. Disturbance for each multi-well pad location would range between approximately 5.5 and 19 surface acres, with each multi-well pad supporting up to 64 wells. Ancillary facilities associated with the proposed natural gas wells include standard equipment on well pads (e.g., well heads, solar panels), water disposal wells, existing and new pipelines, powerlines, access roads, and regional gathering facilities (RGFs).

The exact locations of wells and ancillary facilities have not been identified at this time. Placement of final surface locations on BLM-administered land would be contingent on any environmental constraints identified during the Application for Permit to Drill (APD) process and the onsite inspection reviews conducted by the BLM. The Proposed Action would result in an estimated short-term surface disturbance of up to 6,340 acres within the Project Area (4.5 percent of the Project Area). Up to 1,890 acres (or 1.3 percent of the Project Area) may remain disturbed for the life of the project, consisting of permanent facilities (e.g., RGFs), access roads, and equipment areas needed for ongoing production, servicing, and maintenance activities.

Jonah Energy's objective is to develop natural gas resources from Federal, State, and private leases within the Project Area to efficiently produce commercial and economic quantities of natural gas and condensate. Jonah Energy estimates that the NPL Project could yield 3,500 to 7,000 billion cubic feet (BCF) of gas and 17.5 to 140 million barrels (bbls) of condensate over the estimated 40-year life of the project. Jonah Energy would transport products from wells via pipeline to RGFs for processing, before transporting to sales points by truck or pipeline.

## Purpose and Need for Action

The BLM's purpose is to respond to the proposal by Jonah Energy to develop and extract natural gas resources underlying Jonah Energy's Federal oil and gas leases within the Project Area. The need for the action is to facilitate exploration and development of Federal oil and gas leases, within the constraints of lease terms and conditions, allowing the lessee(s) or their designated operators to drill for, extract, remove, and market Federal natural gas resources. This need is established by the BLM's responsibility under applicable mineral leasing and development statutes, regulations, and policies, as described in Section 1.6 (*Regulatory Setting*).

The BLM will decide whether to approve, approve with modification, or deny Jonah Energy's proposal. Subsequent to a ROD, the BLM would require site-specific APDs and other necessary permits and authorizations, as required by applicable statutes and regulations, to develop natural gas resources in the Project Area. If the site-specific APD or other permit authorization is approved, the BLM will determine the Conditions of Approval (COAs) associated with the action.

Decisions made in the NPL Project ROD would apply to all lessees and operators for development on BLM-administered land in the Project Area through land use authorizations and/or written orders of the Authorized Officer.

## Scoping and Issue Identification

The formal scoping process for the NPL Project began with publication of the NOI in the *Federal Register* on April 12, 2011 (76 FR 20370). The NPL Project scoping period ran from April 12 to May 12, 2011. The BLM accepted comments and included them in the *NPL Natural Gas Development Project Scoping Report* (BLM 2011a) if the comments were received within 15 days after the last scoping meeting (i.e., by May 19, 2011). The BLM hosted three scoping meetings held May 2–4, 2011 in Pinedale, Marbleton, and Rock Springs, Wyoming. The scoping meetings gave agencies, organizations, the public, and other interested parties an opportunity to learn and ask questions about the NPL Project and to share issues and concerns with the BLM.

Scoping for the NPL Project provided an early and open process for determining the scope of issues addressed in this EIS. The BLM used scoping for the NPL Project to solicit internal and external input and comments on the issues, impacts, and potential alternatives the agency addresses in this EIS and the scope of the analysis.

Based on the comments submitted during scoping, the BLM developed 29 issue statements, in the form of questions, that describe the general issues and concerns identified during scoping. The *NPL Natural Gas Development Project Scoping Report* provides additional detail on the issues identified during the scoping period (BLM 2011a). The BLM used the issues to define the scope of the analysis of this EIS and to develop and refine alternatives. In addition to the issues identified during scoping, the BLM also continued to consider issues and concerns during the EIS process as the BLM received additional input from the public, cooperating agencies, and other interested parties. Appendix A (*Scoping Issue Tracking*) further describes the scoping issue statements, the specific concerns and questions encapsulated within each issue statement, and how the issue statements were considered and addressed during the NEPA process and the NPL Project EIS.

**Air Quality:** How would the NPL Project affect air quality?

**Climate Change:** While considering current, applicable agency policy, how would climate change affect the proposed NPL Project and how would the NPL Project affect climate change?

**Cultural Resources:** How would the proposed NPL Project affect cultural and tribal resources?

**Cumulative Impacts:** What are the cumulative impacts associated with current and future development in the region?

**Health and Safety:** How would the NPL Project affect human health in the region?

**Invasive Species:** How would the NPL Project affect the establishment and spread of invasive species?

**Land Use:** How will the EIS identify and address land use?

**Livestock Grazing:** How will the NPL Project affect livestock grazing in the area?

**Mitigation:** How will potential adverse impacts to resources and resource uses be reduced or eliminated?

**NEPA Process:** What are the necessary steps to ensure an adequate and defensible NEPA process and EIS? How will the NPL Project EIS consider and incorporate other appropriate NEPA documents?

**Oil and Gas Operations:** What equipment, techniques, and design features will be implemented on the NPL Project to respond to local and regional conditions?

**Policies, Regulations, and Permitting:** How will the NPL Project and approval process consider applicable policies, regulations, and permitting? Under what circumstances will the BLM grant exceptions, waivers, or modifications to oil and gas lease stipulations on leases within the NPL Project Area?

**Reclamation:** How will the NPL Project and NEPA Process support appropriate and successful reclamation?

**Recreation:** How will the NPL Project affect outdoor recreation?

**Social and Economic:** How will the NPL Project affect economic conditions on local, regional, and national levels? How will the NPL Project affect social conditions and quality of life?

**Soils:** How will the NPL Project affect soils?

**Special Status Species:** Will the NPL Project affect special status species and their habitat?

**Stakeholder Involvement:** How will the NEPA process and the proponent facilitate stakeholder involvement?

**Surface Disturbance:** To what extent should the BLM limit surface disturbance within the Project Area?

**Traffic and Transportation:** How will the NPL Project affect traffic and transportation and local roads?

**Vegetation and Wetlands:** How will the NPL Project avoid, minimize, or mitigate any adverse effects to wetlands?

**Visual:** How will the NPL Project affect viewsheds and visibility?

**Water:** How will the NPL Project affect surface water and groundwater resources?

**Wild Horses:** How will the NPL Project minimize impacts on wild horses?

**Wildlife:** How will the NPL Project affect wildlife and habitat?

## **Proposed Action and Alternatives**

Chapter 2 (*Proposed Action and Alternatives*) of this EIS describes the No Action Alternative, Proposed Action, and two additional action alternatives (alternatives A and B). Chapter 2 also identifies the features that would be common to all action alternatives and the alternatives that were considered, but eliminated from further analysis.

### **Features Common to All Alternatives**

For all alternatives, Jonah Energy would comply with all applicable Laws, Ordinances, Regulations, and Standards (LORS), and would meet the requirements of all needed permits. Development would also be in conformance with valid existing lease rights in the Project Area. The BLM would consider granting exceptions, modifications, and waivers to Federal oil and gas lease stipulations or terms and conditions for ROW grants in accordance with the process established by existing resource management plans (RMPs) and associated amendments. Exceptions would generally only be granted for critical or emergency situations that may cause the applicant to be out of compliance with the timing limitations attached to the terms and conditions of their APD or ROW grant.

The BLM would require Jonah Energy to implement resource protection measures, including Operator-Committed Practices (OCPs), best management practices (BMPs), and other design features that are part of the Proposed Action or other action alternatives to eliminate or reduce potential adverse impacts on the environment. Resource protection measures that are carried forward in the NPL Project ROD would be included as COAs as applicable during permitting for site-specific development of the NPL Project. The BLM would actively monitor resource conditions (e.g., wildlife, soils, water quality, vegetation, naturalness in lands with wilderness characteristics) and reclamation success throughout the life of the project. Where deemed appropriate, the BLM would direct Jonah Energy to take corrective actions to improve reclamation methods and reduce short- and long-term impacts to resources.

Per existing Federal and State regulations, proposed emission sources in the Upper Green River Basin (UGRB) ozone nonattainment area that are not permitted or regulated through existing Wyoming Department of Environmental Quality (DEQ) permitting mechanisms must be addressed for the purposes of General Conformity. If necessary, NPL Project drilling and development under any alternative will be restricted to ensure that development activities meet the requirements contained within the General Conformity regulations before the project is ultimately approved.

Development under all alternatives would be consistent with the State of Wyoming Greater Sage-Grouse Core Area Protection Strategy (State of Wyoming 2015) and the BLM Wyoming Sage-Grouse RMP Amendments (BLM 2015e), or more current guidance as it is adopted. These strategies identify various protection measures that would be applied to the NPL Project to maintain the health and viability of Sage-Grouse. Under all alternatives, development would be allowed on a limited scale in Winter Concentration Areas. A study would be conducted concurrently with development activities to better understand the impacts of developing in Winter Concentration Areas. The results of the study, current information available at the time of site-specific permitting, and current guidance at the time of site-specific permitting would inform BLM understanding of impacts and subsequent development in Winter Concentration Areas, which would inform analysis during site-specific NEPA reviews.

For all action alternatives, initial delineation wells would be drilled as needed to advance understanding of the location and extent of natural gas resources in previously unexplored portions of the Project Area, typically using single-well pads. Findings of these initial delineation efforts would determine if further delineation efforts should be undertaken in the vicinity of the initial delineation wells. Jonah Energy

would install supervisory control and data acquisition (SCADA) equipment on all well locations to remotely monitor well data. SCADA equipment would gather well data in real time from remote locations and would reduce traffic and human activity associated with well monitoring and control during production.

## Description of Alternatives

The descriptions below summarize the key concepts of the alternatives that are analyzed in this EIS. Table ES-1 compares the alternative components and estimated surface disturbance for the alternatives.

**No Action Alternative:** Consideration of the No Action Alternative provides a baseline for analyzing impacts (including cumulative impacts) resulting from implementation of the Proposed Action and other action alternatives and is required under CEQ Regulations (Section 1502.14[d]). For the No Action Alternative, the BLM Authorized Officer would deny Jonah Energy's applications related to the Proposed Action and associated land-use applications. However, existing federal oil and gas leases within the Project Area would remain valid unless they were not otherwise in compliance with applicable laws and regulatory requirements. Federal oil and gas resources could continue to be developed and produced on an individual-lease or unit-area basis. For the purpose of analysis, the BLM assumes that development and production would continue at the rate that has been seen in the Project Area since 1997: drilling and completion of approximately three new wells per year from single or multi-well pads, for a 10-year development period, along with construction and maintenance of ancillary facilities associated with productive wells.

**Proposed Action:** The Proposed Action is Jonah Energy's development proposal for the NPL Project and includes a maximum of 3,500 directionally drilled wells during a 10-year development period within the 140,859 acre Project Area. The rate of well development would be up to 350 new wells per year along with associated well pads, access roads, pipelines, regional gathering facilities, and other ancillary facilities. The life of the project is assumed to be approximately 40 years. Directionally drilled wells would be drilled from multi-well pads, with an average of four multi-well pads per 640-acre area outside designated Sage-Grouse Priority Habitat Management Areas (PHMA). Inside Sage-Grouse PHMA, Jonah Energy would construct an average of one multi-well pad per 640-acre section, consistent with state of Wyoming Executive Order (EO) 2015-4, *Greater Sage-Grouse Core Area Protection* (State of Wyoming 2015), and the BLM Wyoming Sage-Grouse RMP Amendments (BLM 2015e).

**Alternative A:** This alternative was developed primarily to address sensitive wildlife resources identified during scoping (BLM 2011a) and the alternatives development process. For Alternative A, the maximum number of wells would be the same as the Proposed Action, but the location, timing, and pattern of development would be different than the Proposed Action with the timing of development occurring sequentially in three geographically defined Phases (Map 4). The maximum allowable density of development within identified Development Areas (DAs) would be largely driven by the presence or absence of delineated wildlife habitats in a given DA and the expanse of those habitats, if present (Map 5). The BLM would apply additional resource protection measures for wildlife species within delineated habitats of DAs where species are considered a focus species.<sup>1</sup> The development period would be slightly longer than that of the Proposed Action resulting in slightly fewer new wells drilled per year, on average. Development under Alternative A would occur sequentially within the DAs identified for the

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<sup>1</sup>Focus species are species with existing delineated habitats that warrant additional management focus due to species status, quantity and quality of habitat, issues identified during scoping, or other factors. Refer to Section 2.7.6 (Resource Protection Measures for Alternative A) for more information.

three Phases starting with Phase 1, adjacent to the Jonah Infill Drilling Project Area (JIDPA). Development in Sage-Grouse PHMA would be phased during the development period with the PHMA divided into three DAs with one DA occurring in each Phase (Map 5).

**Alternative B:** Alternative B is the BLM Preferred Alternative and was developed to address concerns expressed during scoping associated with conserving a broad range of resource values and focusing development in the least environmentally sensitive areas. In contrast to Alternative A, where the density of development and development limitations would be based primarily on wildlife habitat for focus species, development for Alternative B would be based on a broader range of resources including visual resources, paleontological resources, surface water features, identified lands with wilderness characteristics, and other resources (including wildlife habitat). Under Alternative B, the maximum number of wells would be the same as for the Proposed Action, but the DA 1 area (Map 6) would have a reduced density of development, reduced surface disturbance, and more clustering of disturbance locations to reduce impacts to a range of sensitive resources in this area. For Alternative B, the development period would be slightly longer than that of the Proposed Action resulting in slightly fewer new wells drilled per year (on average).

In addition to the Alternative B development prescriptions in the identified DAs (e.g., an average of up to 1 disturbance location per 640 acres in DA 1), Alternative B includes two potential development scenarios for Sage-Grouse Winter Concentration Areas: 1.) Winter Concentration Area development scenario 1 applies a seasonal timing limitation on development during the wintering period as identified in the BLM Wyoming Sage-Grouse RMP Amendments (BLM 2015e), and 2.) Winter Concentration Area development scenario 2 applies the seasonal timing limitation as well as additional resource protection measures in Winter Concentration Areas including a disturbance threshold and other measures to reduce potential impacts. Under both scenarios, development would be allowed on a limited scale in Winter Concentration Areas. A study would be conducted concurrently with development activities to better understand the impacts of developing in Winter Concentration Areas. The objectives and details of the study will be coordinated with the BLM, WGFD, and other appropriate parties. The results of the study, current information available at the time of site-specific permitting, and current guidance at the time of site-specific permitting would inform BLM understanding of impacts and subsequent development in Winter Concentration Areas, which would inform analysis during site-specific NEPA reviews.

Inclusion of two Sage-Grouse Winter Concentration Area development scenarios provides for a range of development scenarios in the NPL EIS with Winter Concentration Area development scenario 1 reflecting current guidance in EO 2015-4 and the BLM Wyoming Sage-Grouse Amendments (BLM 2015e) and Winter Concentration Area development scenario 2 providing additional protection measures based on issues identified during scoping and other rationale as described in Section 2.8.6 (*Resource Protection Measures for Alternative B*). Both development scenarios would recognize and be consistent with valid existing rights and guidance at the time of site-specific permitting.

Table ES-1. Comparison of Alternatives

New Facility/Feature	Estimated New Surface Disturbance by Alternative														
	No Action			Proposed Action			Alternative A			Alternative B, Winter Concentration Area Development Scenario 1			Alternative B, Winter Concentration Area Development Scenario 2		
	Size or Number	Short-term (acres)	Long-term (acres)	Size or Number	Short-term (acres)	Long-term (acres)	Size or Number	Short-term (acres)	Long-term (acres)	Size or Number	Short-term (acres)	Long-term (acres)	Size or Number	Short-term (acres)	Long-term (acres)
<b>Wells and Well Pads</b>															
New Wells	30 wells <sup>1</sup>	111 <sup>1</sup>	45 <sup>5</sup>	3,500 wells	3,180	795	3,500 wells	3,004	751	3,500 wells	2,849	712	3,500 wells	2,849	712
Subtotal	-	111	45	-	3,180	795	-	3,004	751	-	2,849	712	-	2,849	712
<b>Construction and Production Facilities</b>															
Regional Gathering Facilities or Compressor Stations	0 <sup>2</sup>	0	0	11 <sup>8</sup>	220	220	11 <sup>8</sup>	220	220	11 <sup>8</sup>	220	220	11 <sup>8</sup>	220	220
Subtotal	0	0	0	-	220	220	-	220	220	-	220	220	-	220	220
<b>Linear Features</b>															
Gas Pipelines	12 miles 30-foot wide ROW	45 <sup>3</sup>	0 <sup>6</sup>	227 miles Pipelines and Roads share 100-foot ROW	2,065	0 <sup>6</sup>	195 miles Pipelines and Roads share 100-foot ROW	1,958	0 <sup>6</sup>	205 miles Pipelines and Roads share 100-foot ROW	1,864	0 <sup>6</sup>	205 miles Pipelines and Roads share 100-foot ROW	1,864	0 <sup>6</sup>
Access Roads	12 miles 40-foot wide ROW	57 <sup>4</sup>	34 <sup>7</sup>	227 miles	688	688	215 miles	653	653	205 miles	621	621	205 miles	621	621
Electric Powerlines	0 <sup>2</sup>	0	0	38.6 miles 40-foot ROW	187	187	38.6 miles 40-foot ROW	187	187	38.6 miles 40-foot ROW	188	188	38.6 miles 40-foot ROW	188	188
Condensate and Produced Water Pipelines in Project Area (share same trench)	NA	NA	NA	NA	NA	NA	50 miles 50-foot ROW <sup>9</sup>	302	0	NA	NA	NA	15 miles 75-foot ROW	132	0
Condensate Pipeline (outside Project Area)	NA	NA	NA	NA	NA	NA	70 miles 50-foot ROW	424 <sup>10</sup>	0	NA	NA	NA	NA	NA	NA
Subtotal	-	102	34	-	2,940	875	-	3,525	840	-	2,673	809	-	2,805	809
<b>Short-term Surface Disturbance Totals</b>															
Total Short-term Surface Disturbance	-	213	-	-	6,340	-	-	6,748 <sup>11</sup>	-	-	5,742	-	-	5,874	-
Total Short-term Surface Disturbance as percent of Project Area	-	0.15%	-	-	4.5%	-	-	4.5% <sup>11</sup>	-	-	4.1%	-	-	4.2%	-
<b>Long-term Surface Disturbance Totals</b>															
Total Long-term Surface Disturbance	-	-	79	-	-	1,890	-	-	1,811	-	-	1,741	-	-	1,741
Long-term Surface Disturbance as percent of Total Project Area	-	-	0.06%	-	-	1.3%	-	-	1.3%	-	-	1.2%	-	-	1.2%

<sup>1</sup>Assumes 3.7 acres of short-term disturbance per well for wells over a 10-year period, per the BLM PFO Proposed RMP and Final EIS (BLM 2008b).

<sup>2</sup>Assumes no new RGFs, compressor facilities, or powerlines.

<sup>3</sup>Assumes 1.5 acres of short-term disturbance for pipelines for each well per the BLM PFO Proposed RMP and Final EIS (BLM 2008b).

<sup>4</sup>Assumes 1.9 acres of short-term disturbance for access roads for each well per the BLM PFO Proposed RMP and Final EIS (BLM 2008b).

<sup>5</sup>Assumes 1.5 acres of long-term disturbance for access roads for each well per the BLM PFO Proposed RMP and Final EIS (BLM 2008b).

<sup>6</sup>Assumes surface disturbance from pipelines will be fully reclaimed after interim reclamation.

<sup>7</sup>Assumes 1.14 acres of long-term disturbance for access roads for each well per the BLM PFO Proposed RMP and Final EIS (BLM 2008b).

<sup>8</sup>Assumes 20 acres of short-term surface disturbance for RGFs that would persist for the life of the project (no interim reclamation).

<sup>9</sup>Assumes that the 50 miles of buried pipeline for the condensate and produced water from RGFs to offsite facilities would share the same trench. All disturbance in the Project Area associated with these pipelines is therefore accounted for under the Produced Water Pipeline.

<sup>10</sup>Represents surface disturbance outside of the Project Area for the buried condensate pipeline from the edge of the Project Area to the farthest potential condensate sales point (Granger Facility). If this option moves forward as part of the Preferred Alternative, the BLM

Table ES-1. Comparison of Alternatives

New Facility/Feature	Estimated New Surface Disturbance by Alternative														
	No Action			Proposed Action			Alternative A			Alternative B, Winter Concentration Area Development Scenario 1			Alternative B, Winter Concentration Area Development Scenario 2		
	Size or Number	Short-term (acres)	Long-term (acres)	Size or Number	Short-term (acres)	Long-term (acres)	Size or Number	Short-term (acres)	Long-term (acres)	Size or Number	Short-term (acres)	Long-term (acres)	Size or Number	Short-term (acres)	Long-term (acres)

would further define and analyze the route and corridor as part of the Project Area.

<sup>11</sup>Percentage disturbance in Project Area does not include the 424 acres of disturbance for the buried condensate pipeline from the edge of the Project Area to condensate sales points outside the Project Area. Total short-term surface disturbance in the Project Area would be an estimated 6,324 acres.

RGF Regional Gathering Facility  
 ROW Right-of-way

Note: Refer to Appendix D (Surface Disturbance and Duration of Development Worksheets) for more information on surface disturbance estimates.

## Alternatives Considered, but Eliminated from Further Analysis

During the NPL Project EIS process, the BLM considered several alternatives and alternative components that were eventually eliminated from detailed analysis in this EIS:

- A **wildlife and resource protection** alternative that would guide development in response to sensitive wildlife resources as well as other issues identified during scoping. This alternative was eliminated from further detailed analysis because it would be substantially similar to, and result in similar effects as, other action alternatives being analyzed in this EIS.
- A **paced development** alternative that would analyze a range of development paces to respond to public and agency concerns related to project-related air emissions and impacts on air quality. This alternative was eliminated from further detailed analysis because lower paces of development may not be technically or economically feasible and because project-related emissions would be addressed by General Conformity regulations.
- A **no net increase emissions** alternative that would address the EPA's designation of marginal ozone nonattainment for the UGRB through the use of emission offsets or credits. This alternative was eliminated from detailed analysis due to the lack of remaining offsets and credits available in UGRB that would be required to implement the alternative.
- A **Project Area-wide low density of development** alternative that would limit the density of development to one well pad per 640-acres across the entire Project Area, which would reduce surface disturbance compared to the Proposed Action and other action alternatives. This alternative was eliminated because other alternatives limit development density, it did not respond to localized issues identified during scoping, and concerns about its economic viability.
- An alternative requiring **use of surface pipelines** instead of buried pipelines to reduce surface disturbance. This alternative was eliminated from further detailed analysis because the BLM determined that, based on past and current technology and practice, surface pipelines would be technically or economically infeasible and may increase potential impacts.
- An alternative requiring onsite **evaporation ponds** to store and treat wastewater to reduce the number of vehicle trips and to reduce the need for water disposal and injection in other areas. This alternative was eliminated from detailed analysis because the BLM determined that approved operations in the Project Area may not produce enough water to make evaporation ponds technically or economically feasible, and that evaporation ponds could result in more impacts to wildlife and other resources than water disposal and injection.
- An alternative **prohibiting development in lands with wilderness characteristics** in the Project Area. This alternative was eliminated from detailed analysis for not meeting the purpose and need and not honoring valid and existing lease rights.
- A **No Action Alternative with an increased level of development**, consisting of 61 new wells per year, in the Project Area. This alternative was eliminated from detailed analysis because the BLM determined that the No Action Alternative of three new wells per year represents the reasonably foreseeable development in the Project Area and provides a useful baseline for comparison of environmental effects resulting from the action alternatives.
- An alternative with **additional protection measures for development in Sage-Grouse Winter Concentration Areas**, including shutting in wells during the wintering period; prohibiting RGFs and powerlines; requiring all powerlines be buried; a longer seasonal timing limitations; and other measures. This alternative was eliminated from detailed analysis because the BLM determined that these additional protection measures would not be technically or economically feasible.

## Affected Environment

Chapter 3 (*Affected Environment*) of the EIS describes the affected physical, biological, human, and management environment of the NPL Project Area. The identified resources present within the Project Area provide the basis to address substantive issues of concern brought forward during internal and public scoping. Chapter 3 provides quantitative data and spatial information where appropriate to the resource, which serves as a baseline for comparison of the direct, indirect, and cumulative impacts of each of the alternatives.

The Project Area encompasses 140,859 acres and is located primarily on BLM-administered lands managed by the BLM Pinedale Field Office (PFO) and Rock Springs Field Office (RSFO) within Townships 27 through 29 North, Ranges 107 through 110 West, 6th Principal Meridian, in Sublette County, Wyoming. The Project Area is located entirely in Sublette County, Wyoming; however, the southern boundary of the Project Area is directly adjacent to the Sweetwater County line. The Project Area is bordered to the north by two large-scale oil and gas development projects including the Jonah Infill Development Project to the northeast and the Pinedale Anticline Project to the north.

Existing development in the Project Area includes 55 producing natural gas wells and associated infrastructure, roads, electric transmission lines, stock water wells, and other range improvements. In total, surface disturbance from existing development encompasses approximately 1,573 acres (1.1 percent) of the Project Area.

The Project Area is in the UGRB, which lies between two mountain ranges—the Wyoming Range to the west with peak elevations of approximately 11,500 feet above sea level, and the Wind River Range to the east with peak elevations of approximately 13,800 feet above sea level. Topography within the basin is generally gently rolling, with elevations ranging from approximately 7,000 to 8,200 feet. Topography in the Project Area is characterized by low rolling hills interspersed with buttes, rock outcrops, large draws, and deep canyons.

The Project Area is in a semiarid (dry and cold) mid-continental climate regime, characterized by dry, windy conditions, with limited rainfall and long, cold winters. All drainages in the Project Area are ephemeral and intermittent, which do not hold surface water year-round, and most streams only flow following snowmelt and precipitation events.

Vegetation in the Project Area consists primarily of shrub-steppe habitat dominated by Wyoming big sagebrush. Other sagebrush species, rabbitbrush, saltbush, and a variety of forbs and grasses are also in the area. Characteristic fauna inhabiting the Project Area and surrounding areas include pronghorn antelope, mule deer, Greater Sage-Grouse, various raptor and passerine species, white-tailed prairie dog, and other species of mammals and reptiles.

## Environmental Consequences

Chapter 4 (*Environmental Consequences*) of the EIS describes the environmental effects of implementing the Proposed Action and alternatives on the affected environment described in Chapter 3. The chapter is divided into subsections that analyze potential impacts to the range of potentially affected resources. The resource-specific effects of the alternatives are evaluated quantitatively and qualitatively, as appropriate, based on available data and the nature of the resource analyzed. Table ES-1 above compares the estimated surface disturbance for the alternatives and Table ES-2 below summarizes the impacts analysis in Chapter 4 (*Environmental Consequences*).

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
<p><b>Air Quality</b></p>	<p>A project-specific emission inventory indicates that development emissions would not exceed the UGRB ozone marginal nonattainment area annual General Conformity <i>de minimis</i> emission limits.</p> <p>As indicated in Section 4.2.3.3 (<i>Far-Field Modeling Results for the Proposed Action</i>), NPL Project EIS air quality modeling indicates two potential exceedances of NAAQS, including exceedance of the 8-hour ozone design value at the Boulder monitoring site (Table 4-13) and exceedance of the 24-hour PM<sub>10</sub> design value at the Wamsutter monitoring site (Table 4-16). These exceedances of NAAQS occurred during the base year scenario and NPL EIS modeling indicates that the exceedances would occur under the No Action Alternative, regardless of the NPL Project.</p> <p>Overall, projected criteria pollutant concentrations</p>	<p>A project-specific emission inventory indicates that development in years 2 through 10 could exceed the UGRB ozone marginal nonattainment area annual General Conformity <i>de minimis</i> emission limits of 100 tons/year of NO<sub>x</sub>. However, application of the mitigation measure to reduce annual development to a level that would not exceed the <i>de minimis</i> emissions limits would reduce the potential for this impact.</p> <p>Similar to the No Action Alternative, NPL Project EIS air quality modeling indicates two potential exceedances of NAAQS, including exceedance of the 8-hour ozone design value at the Boulder monitoring site (Table 4-13) and exceedance of the 24-hour PM<sub>10</sub> design value at the Wamsutter monitoring site (Table 4-16) under the future-year Proposed Action scenario. These modeled exceedances of NAAQS occurred during the</p>	<p>Similar to Proposed Action, but with minor net reductions in annual emissions of criteria pollutants, short-term exposure to HAPs, ozone and PM<sub>2.5</sub> design values, visibility impairment, and atmospheric deposition during development due to slight reduction in number of new wells drilled per year.</p>	<p>Same as Alternative A.</p>	<p>Same as Alternative A.</p>

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
	<p>for the No Action Alternative are lower than the corresponding base-year concentrations.</p> <p>Short-term and long-term human exposure to HAPs and associated health impacts are expected to be minimal compared to acute reference exposure levels.</p> <p>Modeling results indicate improved visibility in nearby Class I and Class II areas compared to the base year.</p> <p>Simulated changes in atmospheric deposition of nitrogen and sulfur to sensitive lakes under this scenario is expected to be minimal.</p>	<p>base-year and are projected to occur under the No Action Alternative scenario, regardless of the NPL Project. The NPL Project is projected to contribute to a 0.1-ppb increase above the No Action Alternative 8-hour ozone design value at the Boulder station and a 0.3-<math>\mu\text{g}/\text{m}^3</math> increase above the No Action Alternative <math>\text{PM}_{10}</math> design value at the Wamsutter site. Short-term and long-term human exposure to HAPs is expected to be greater than for the No Action Alternative, but still minimal compared to acute reference exposure levels.</p> <p>Modeling results indicate that the impacts on visibility in the nearby Class I and Class II areas would be infrequent and small.</p> <p>Simulated changes in atmospheric deposition could exceed the DAT for nitrogen deposition in the Popo Agie Wilderness Area, but are not expected to</p>			

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
		exceed thresholds for sensitive lakes.			
<b>Climate Change</b>	The relatively low level of anticipated development would contribute limited GHG emissions relative to the regional and global budget of GHGs in the atmosphere, with minimal potential to contribute to climate change effects.	Estimated project GHG emissions in 2020 represent 0.27 percent of the total estimated GHG emissions for the State of Wyoming. Project emissions would contribute to the regional and global GHGs in the atmosphere, and could contribute to climate change effects. It is not possible at this time to link projected GHG emissions associated with the Proposed Action to specific environmental impacts within the analysis area.	Similar GHG emissions and potential contributions to climate change as the Proposed Action, though to slightly lesser degree each year during the development period due to slight reduction in number of new wells per year.	Same as Alternative A.	Same as Alternative A.
<b>Cultural Resources</b>	Potential adverse impacts to cultural resources if development occurs within the three-mile viewshed of the Sublette Cutoff and North Sublette Meadow Spring Variant, within the Teakettle Dune Field, or affects NRHP-eligible sites or undiscovered cultural resources. However, due to the relatively low level of development, minimal	Potential adverse impacts within the three-mile viewshed of the Sublette Cutoff and North Sublette Meadow Spring Variant would include project-related activities and construction that result in the introduction of visual elements that diminish the integrity of significant historic features.	Fewer adverse impacts to the historic setting of the Sublette Cutoff and North Sublette Meadow Spring Variant than the Proposed Action due prohibition of RGFs, compressor stations, and powerlines in delineated mountain plover habitat and raptor buffers in DA 3 within the three-mile viewshed of the trails.	Potential impacts to the historic setting of the Sublette Cutoff and North Sublette Meadow Spring Variant would be as described for the Proposed Action. Potential impacts on NRHP-eligible sites and undiscovered cultural resources would be similar to the Proposed Action, but less likely in DA1.	Potential impacts to the historic setting of the Sublette Cutoff and North Sublette Meadow Spring Variant would be as described for the Proposed Action. Potential impacts on NRHP-eligible sites and undiscovered cultural resources would be similar to the Proposed Action, but less likely in DA1.

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
	<p>adverse impacts to cultural resources are anticipated.</p>	<p>Project activities could also destroy, damage, or alter the setting of NRHP-eligible sites or undiscovered cultural resources.</p> <p>Development and surface disturbance in the Teakettle Dune Field could increase erosion and sand movement, destabilize areas of the dune field, increase the potential for exposure and degradation of cultural resources, and increase the potential for vandalism and illegal collecting.</p> <p>Mitigation Measures C-3 and C-4 would reduce potential impacts to historic trails and the Teakettle Dune Field by requiring appropriate mitigation, agreement documents, and other considerations if potential impacts are identified during site-specific permitting.</p> <p>The greatest potential for impacts would occur in the portions of the trail viewsheds and dune field</p>	<p>Potential impacts on NRHP-eligible sites and undiscovered cultural resources would be similar to the Proposed Action, but less likely in Sage-Grouse Winter Concentration Areas and delineated habitats for other focus species. Potential impacts on cultural resources in the Teakettle Dune Field would be as described for the Proposed Action.</p> <p>Similar to the Proposed Action, mitigation measures C-3 and C-4 would reduce potential impacts to historic trails and the Teakettle Dune Field by requiring appropriate mitigation, agreement documents, and other considerations if potential impacts are identified during site-specific permitting.</p>	<p>Potential impacts on cultural resources in the Teakettle Dune Field would be similar to the Proposed Action.</p> <p>Similar to the Proposed Action, mitigation measures C-3 and C-4 would reduce potential impacts to historic trails and the Teakettle Dune Field by requiring appropriate mitigation, agreement documents, and other considerations if potential impacts are identified during site-specific permitting.</p>	<p>Potential impacts on cultural resources in the Teakettle Dune Field would be similar to the Proposed Action, unless buried pipelines between RGF locations cross the Teakettle Dune Field, increasing the potential for erosion and destabilization of the dune field. However, it is likely that RGF locations and buried pipelines could be routed to avoid the Teakettle Dune Field.</p> <p>Similar to the Proposed Action, mitigation measures C-3 and C-4 would reduce potential impacts to historic trails and the Teakettle Dune Field by requiring appropriate mitigation, agreement documents, and other considerations if potential impacts are identified during site-specific permitting.</p>

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
		outside of Sage-Grouse PHMA due to a higher density of development in these areas.			
<b>Fire and Fuels Management</b>	Increased ignition sources and chance of wildfire commensurate with the anticipated development of three new wells per year and 213 acres of short-term disturbance. Construction of 12 miles of access roads would provide additional fire breaks and aid in response to wildfires.	Increased ignition sources, chance of wildfire, and potential for establishment and spread of invasive species commensurate with the development of 3,500 new wells and 6,340 acres of short-term disturbance.  Potential beneficial impacts include the increased ability to spot wildfires from additional workforce and the construction of 227 miles of access roads, which would provide additional fire breaks and aid in response to wildfires.	Increased ignition sources, chance of wildfire, and potential for establishment and spread of invasive species would be similar to those described for the Proposed Action, though to a lesser degree within the Project Area due to a reduced density of development and surface disturbance thresholds in certain habitats. However, an additional 424 acres of short-term surface disturbance for the construction of a buried pipeline outside the Project Area could increase the potential adverse impacts in that area compared to the Proposed Action.  The construction of 12 less miles of access roads than the Proposed Action, which would provide fewer fire breaks and access points for emergency wildfire response.	Decreased ignition sources, chance of wildfire, and potential for establishment and spread of invasive species compared to the Proposed Action due to a decrease in short- and long-term surface disturbance, especially within DA 1. The construction of 22 less miles of access roads compared to the Proposed Action would provide fewer fire breaks and access points for emergency wildfire response.	Similar to Alternative B Winter Concentration Area Development Scenario 1, except construction of additional buried pipelines could increase the potential for accidental ignitions during construction of these pipelines and alteration of fire regimes in adjacent areas from the spread of invasive species.

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
<p><b>Geology and Mineral Resources</b></p>	<p>Potential impacts to geology and geologic hazard potential would be minimal due to the generally low level of development under the No Action Alternative.</p> <p>Cumulative production estimates over the life of the project are 14,252 MMCF of gas and 98,167 bbls of condensate.</p>	<p>Alterations to existing topography would occur from 6,340 acres of short-term disturbance (4.5 percent of Project Area) and 1,890 acres of long-term disturbance (1.3 percent of Project Area), including the construction of well pads, roads, and associated infrastructure. Indirect impacts could result from weathering of disturbed areas and slope and drainage alterations, especially in areas where soils have higher susceptibility to erosion. Potential for these impacts would be greatest in non Sage-Grouse PHMA, corresponding with a higher level of development in these areas.</p> <p>Cumulative production estimates over the life of the project are 3,500 to 7,000 BCF of gas and 17.5 to 140 million bbls of condensate.</p>	<p>Similar types of impacts as the Proposed Action, but less long-term surface disturbance (4.2 percent less than the Proposed Action) and additional limitations on surface disturbance in delineated habitats for focus species for Alternative A would result in indirect beneficial impacts on geology by preserving the existing topography in these areas more than the Proposed Action. An additional 424 acres of short-term surface disturbance for the construction of a buried pipeline outside the Project Area would affect topography and drainage along the corridor to a greater extent than the Proposed Action.</p> <p>Cumulative production estimates and geologic hazard potential are the same as for the Proposed Action.</p>	<p>Similar types of impacts as the Proposed Action, but decreased short and long-term surface disturbance in comparison to the Proposed Action (9.4 percent less and 7.9 percent less, respectively) would reduce the potential for direct impacts from alterations to existing topography. Reduced surface disturbance and fewer disturbance locations in DA 1 would reduce the potential for adverse impacts to geology in that area by reducing the number and extent of disturbance locations that would affect existing topography or geologic features compared to the Proposed Action</p> <p>Cumulative production estimates and geologic hazard potential are the same as for the Proposed Action.</p>	<p>Similar types of impacts as the Proposed Action, but decreased short and long-term surface disturbance in comparison to the Proposed Action (7.4 percent less and 7.9 percent less, respectively) would reduce the potential for direct impacts from alterations to existing topography. Reduced surface disturbance, fewer disturbance locations, and a more clustered pattern of development in DA 1 would reduce the potential for adverse impacts to geology in that area by reducing the number and extent of disturbance locations that would affect existing topography or geologic features compared to the Proposed Action</p> <p>Cumulative production estimates and geologic hazard potential are the same as for the Proposed Action.</p>

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
		<p>There is a very low likelihood for the Proposed Action to result in adverse impacts from induced seismicity caused by the injection of produced water.</p>			
<p><b>Hazardous Materials and Solid Waste</b></p>	<p>Generation of hazardous and nonhazardous wastes and risk of leaks and spills associated with construction and operation activities could result in localized adverse impacts to human health and the environment, but minimal impacts are anticipated due to the relatively low level of anticipated development.</p>	<p>Construction and operation activities would generate hazardous and nonhazardous wastes and increase the risk of leaks and spills with the potential to affect human health or contaminate surrounding soils, surface waters, and groundwater.</p> <p>Refer to Appendix F (<i>Hazardous and Non-Hazardous Materials Management Summary</i>) for a complete list of all known hazardous and extremely hazardous materials that could be produced, used, stored, transported, and disposed of for the NPL Project, and could result in adverse impacts through inadvertent release or mishandling.</p>	<p>Same amount of materials as the Proposed Action; however, Alternative A would reduce the overall potential for accidental spills of produced water and condensate by truck, but increase potential for spills and seepage from pipelines and the time required to detect and fix underground leaks because produced water and condensate would be transported by a buried pipeline network and not by truck, as under the Proposed Action. Utilizing North Burma Road as a primary route to transport hazardous materials and solid waste would increase the potential for spills along this route during transport of materials compared to the Proposed Action.</p>	<p>The amounts and uses of hazardous materials would be generally the same as for the Proposed Action, and impacts would be similar. Use of North Burma Road as a primary route to transport hazardous materials and solid waste and associated impacts would be the same as Alternative A.</p>	<p>Same amount of materials as the Proposed Action; however, Alternative B Winter Concentration Area development scenario 2 would increase the potential for spills and seepage from buried pipelines and the time required to detect and fix underground leaks due to the use of buried pipelines to transport produced water and condensate to RGFs outside of Winter Concentration Areas and PHMA. Use of North Burma Road as a primary route to transport hazardous materials and solid waste and associated impacts would be the same as Alternative A.</p>

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
<b>Land Use</b>	Development of 30 new wells in the Project Area would not result in substantial changes to existing land uses and would be unlikely to result in conflicts with other land uses.	<p>Development of 3,500 new wells and associated facilities would result in oil and gas development becoming the dominant land use in the Project Area and could result in land use conflicts with other resource uses including livestock grazing and recreation.</p> <p>The degree of land use change and potential land use conflicts would be greatest in areas with higher densities of development (e.g., non-PHMA Habitat) that overlap other land uses.</p> <p>Land use changes could occur across the Project Area at any time during the 10-year development period, consistent with existing seasonal restrictions and other stipulations.</p>	Due to the similar type and level of development as the Proposed Action, Alternative A would result land use changes and potential for land use conflicts, though to a lesser degree due to a lower density of development in Sage-Grouse Winter Concentration Areas in DA 1 and within delineated habitats for focus species, and the phased pattern of development, which would localize land use changes to the Phase being developed. Geographic phasing of development would make the timing and location of land use changes more predictable and may enhance opportunities to proactively avoid conflicts with other uses.	Due to the similar type and level of development as the Proposed Action, Alternative B Winter Concentration Area development scenario 1 would result land use changes and potential for land use conflicts, though to a lesser degree due to reduced surface disturbance and fewer disturbance locations in DA 1.	Due to the similar type and level of development as the Proposed Action, Alternative B Winter Concentration Area development scenario 2 would result land use changes and potential for land use conflicts, though to a lesser degree due to reduced surface disturbance, fewer disturbance locations, and a more clustered pattern of development in DA 1, especially within Winter Concentration Areas. Geographic phasing of development in Winter Concentration Areas would make the timing and location of land use changes more predictable in that area may enhance opportunities to proactively avoid conflicts with other uses.
<b>Lands with Wilderness Characteristics</b>	Development of three new wells per year and resulting surface disturbance, facilities, and project-related activity could occur in lands with wilderness	Development of well pads, RGFs, overhead powerlines, pipelines, and access roads and ongoing operations would result in short- and long-term direct adverse	Reduced potential for surface disturbance in lands with wilderness characteristics due to reduced density of development in Sage-	Reduced potential for adverse impacts on lands with wilderness characteristics compared to the Proposed Action due to the reduced surface	Reduced potential for adverse impacts on lands with wilderness characteristics compared to the Proposed Action due to the reduced surface

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
	<p>characteristics units within the Project Area. The limited amount of development and disturbance, if any, that could have direct effects to lands with wilderness characteristics, would result in minor and localized impacts on naturalness or outstanding opportunities for solitude or primitive and unconfined forms of recreation.</p>	<p>impacts to lands with wilderness characteristics if development occurs within lands with wilderness characteristics units. All of the identified lands with wilderness characteristics in the Project Area (Map 12) occur outside of Sage-Grouse PHMA, where the density of development and resulting impacts would be greatest.</p> <p>The establishment of roads and ROWs from project-related development could affect the ability of existing lands with wilderness characteristics units to retain their qualification during future inventories. Any surface disturbance and project-related activities in lands with wilderness characteristics would result in a loss of wilderness characteristics while the disturbance/activity persists and until the area returns to pre-disturbance conditions.</p>	<p>Grouse Winter Concentration Areas (26,261 BLM-administered acres; 44 percent of lands with wilderness characteristics in the Project Area), surface disturbance threshold in other delineated habitat for focus species (10,308 BLM-administered acres), and other resource protection measures in delineated habitat for focus species (Map 5).</p> <p>For Alternative A, RGFs, compressor facilities, and powerlines would be prohibited within raptor nest buffers in DA 1, which overlaps 21,426 BLM-administered acres containing lands with wilderness characteristics reducing the potential impacts on naturalness resulting from these facilities, compared to the Proposed Action.</p> <p>Phasing of development would reduce the potential for development and disturbance to occur across all lands with wilderness</p>	<p>disturbance and fewer disturbance locations in the DA 1 area (Map 6), which overlaps 37,536 BLM-administered acres (62 percent) of lands containing wilderness characteristics in the Project Area. Reducing the level and extent of development in DA1, would reduce the frequency and intensity of visual contrasts and would reduce construction and other project-related activity that could degrade naturalness and opportunities for solitude in lands with wilderness characteristics, compared to the Proposed Action.</p>	<p>disturbance, fewer disturbance locations, and a more clustered pattern of development in the DA 1 area (Map 6), which overlaps 37,536 BLM-administered acres (62 percent) of lands containing wilderness characteristics in the Project Area. Reducing the level and extent of development in DA1, especially within Winter Concentration Areas, would reduce the frequency and intensity of visual contrasts and would reduce construction and other project-related activity that could degrade naturalness and opportunities for solitude in lands with wilderness characteristics, compared to the Proposed Action.</p> <p>Buried pipelines would transport produced water and condensate from RGFs within Sage-Grouse Winter Concentration Areas to centralized RGFs outside of these areas. Short-term, adverse impacts from visual</p>

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
			<p>characteristics simultaneously, which could occur under the Proposed Action.</p>		<p>contrasts and noise in lands with wilderness characteristics could occur during construction of these pipelines; however, long-term impacts on wilderness characteristics would be reduced where Winter Concentration Areas overlap lands containing wilderness characteristics (26,261 BLM-administered acres) compared to the Proposed Action due to the reduction in heavy vehicle trips during the production phase.</p> <p>Within Sage-Grouse Winter Concentration Areas, phasing development from east to west would limit the potential for development and disturbance to be occurring across all Winter Concentration Areas at the same time, which also overlaps 26,261 BLM-administered acres of lands with wilderness characteristics. As a result, potential impacts to lands with wilderness characteristics would be</p>

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
					less widespread during the development phase of Alternative B Winter Concentration Area development scenario 2 than for the Proposed Action, where development could occur across Winter Concentration Areas throughout the development period.
<b>Livestock Grazing</b>	Potential reduction in forage through the short-term loss of 25 AUMs and long-term loss of 9 AUMs (<1 percent of total permitted AUMs in the analysis area).	Potential reduction in forage by the short-term loss of 780 AUMs and long-term loss of 232 AUMs. The long-term projected AUM loss is greater than for the No Action Alternative, but still represents less than 1 percent of the total permitted AUMs in the analysis area.  Other potential impacts would include reduced forage availability, changes in vegetative composition due to establishment and spread of invasive plants/noxious weeds, potential for collisions with vehicles, decreased forage	Due to relatively similar levels of disturbance and AUM losses (779 short-term AUM loss and 222 long-term AUM loss), the anticipated impacts on livestock grazing from AUM loss would be similar to those under the Proposed Action.  Alternative A would likely result in more localized forage loss, less extensive changes to vegetation communities, and lower risk of vehicle collisions than the Proposed Action because new development, and resulting disturbance and loss of AUMs, would be	Decreased surface disturbance for Alternative B Winter Concentration Area development scenario 1 would decrease the short-term loss of AUMs (712 AUMs lost) and long-term loss of AUMs (215 AUMs lost) compared to the Proposed Action. Similar to the Proposed Action and Alternative A, the long-term projected AUM loss represents less than 1 percent of the total permitted AUMs in the analysis area. Reduced surface disturbance and fewer disturbance locations in DA 1 would reduce potential adverse impacts in this area	Decreased surface disturbance for Alternative B Winter Concentration Area development scenario 2 would decrease the short-term loss of AUMs (727 AUMs lost) and long-term loss of AUMs (215 AUMs lost) compared to the Proposed Action. Similar to the Proposed Action and Alternative A, the long-term projected AUM loss represents less than 1 percent of the total permitted AUMs in the analysis area. Reduced surface disturbance, fewer disturbance locations, and a more clustered pattern of development in DA 1,

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
		<p>palatability resulting from fugitive dust, and collisions with vehicles.</p>	<p>phased across the Project Area. An estimated 12 less miles of new access roads would further reduce the potential for vehicle collisions, fugitive dust, and other adverse road-related impacts compared to the Proposed Action.</p>	<p>compared to the Proposed Action. An estimated 22 less miles of new access roads would reduce the potential for vehicle collisions, fugitive dust, and other adverse road-related impacts compared to the Proposed Action.</p>	<p>especially in Sage-Grouse Winter Concentration Areas, would reduce potential adverse impacts in this area compared to the Proposed Action. Alternative B Winter Concentration Area development scenario 2 would likely result in more localized forage loss and impacts to grazing operations in Sage-Grouse Winter Concentration Areas than the Proposed Action because new development, and resulting disturbance and loss of AUMs, would be phased from east to west in Winter Concentration Areas. An estimated 22 less miles of new access roads would reduce the potential for vehicle collisions, fugitive dust, and other adverse road-related impacts compared to the Proposed Action.</p>
<b>Noise</b>	<p>The relatively low level of development would result in limited increases in noise in the Project Area and minimal localized adverse</p>	<p>All construction and operations equipment and activities for the NPL Project could result in short-term (during</p>	<p>Similar to the Proposed Action, but with reduced noise impacts to Sage-Grouse and other wildlife due to a phased</p>		<p>Similar to the Proposed Action, but with reduced noise impacts in DA 1 and in Sage-Grouse Winter Concentration Areas due to</p>

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
	<p>impacts on sensitive noise receptors, including Sage-Grouse.</p>	<p>construction) and long-term (during operations) adverse noise impacts on Sage-Grouse (the primary sensitive receptor in the NPL Project Area). Construction noise levels could exceed the 10 dBA noise increase threshold if construction activities are located within distance of the identified noise contours predicted to exceed 10 dBA above the noise levels monitored at each lek perimeter (Table 4-32). Operations noise levels could exceed the 10 dBA noise increase threshold if operations activities are located within distance of the identified noise contours predicted to exceed 10 dBA above the noise levels monitored at each lek perimeter (Table 4-34). Potential impacts to Sage-Grouse would depend on the site-specific location of NPL Project facilities in relation to Sage-Grouse leks and other use areas.</p>	<p>development pattern in Sage-Grouse PHMA, a reduced density of development in Sage-Grouse Winter Concentration Areas, surface disturbance thresholds in delineated habitats for focus species that overlap or occur in close proximity to leks and other habitat, and prohibition of RGFs and overhead powerlines in certain areas that could generate noise that affects Sage-Grouse. Slightly longer period of noise impacts resulting from 0.4-year longer development phase than the Proposed Action; however, the magnitude of noise may be less because 14 fewer wells would be developed per year on average. Similar to the Proposed Action, the BLM would conduct additional ambient noise monitoring and consider current information related to noise impacts to Sage-</p>		<p>reduced density of development and surface disturbance in DA 1 and disturbance thresholds, phasing of development, and centralizing facilities in Winter Concentration Areas. Constructing buried pipelines to transport produced water and condensate from RGFs within Sage-Grouse Winter Concentration Areas and PHMA to RGFs outside of these areas would increase the potential for short-term noise impacts during construction of these facilities, but reduce long-term noise impacts to Sage-Grouse from truck traffic in these areas, compared to the Proposed Action. The length of the development phase and associated impacts would be the same as Alternative A. Similar to the Proposed Action, the BLM would conduct additional ambient noise monitoring and consider current</p>

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
		<p>Prior to authorizing surface-disturbance activities, the BLM would conduct additional noise monitoring to define ambient noise levels for purposes of site-specific permitting.</p> <p>During site-specific permitting, the BLM would further consider current science and research on noise impacts to Sage-Grouse to inform appropriate development locations, design features, and mitigation measures for the NPL Project.</p> <p>No adverse noise impacts are anticipated impacts on residences or onsite workers from project-related activities.</p>	<p>Grouse during site-specific permitting.</p>		<p>information related to noise impacts to Sage-Grouse during site-specific permitting.</p>
<p><b>Paleontology</b></p>	<p>Minimal potential impacts to paleontological resources resulting from 213 acres of new surface disturbance (0.15 percent of the Project Area). The development of 12 miles of new access roads is unlikely to noticeably increase</p>	<p>Increased potential for exposure and possible destruction of paleontological resources compared to the No Action Alternative resulting from 6,340 acres of short-term disturbance (4.5 percent of the Project Area). A lower density of development in</p>	<p>Similar adverse impacts to the Proposed Action, though to greater degree due to additional short-term surface disturbance (6,748 acres). However, lower densities of development or disturbance thresholds in delineated habitats for</p>	<p>Similar adverse impacts to the Proposed Action, though to lesser degree due to reduced short-term surface disturbance (5,724 acres). The DA 1 area contains a large proportion of the Wasatch Formation, which has high potential for vertebrate fossils. The</p>	<p>Similar adverse impacts to the Proposed Action, though to lesser degree due to reduced short-term surface disturbance (5,874 acres). The DA 1 area contains a large proportion of the Wasatch Formation, which has high potential for vertebrate fossils. The</p>

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
	illegal vertebrate fossil collection.	Sage-Grouse PHMA would reduce the potential for adverse impacts to the typically fossil-rich Bridger Formation present in this area. Construction of 227 miles of new access roads would increase access for both permitted and illegal vertebrate fossil collection. Increased access may increase potential for permitted paleontologists and geologists to make scientifically significant discoveries.	focus species (including Sage-Grouse PHMA and Winter Concentration Areas) would reduce the potential for adverse impacts to paleontological resources in these areas by reducing the number of disturbance locations and surface disturbance. Conversely, the potential to discover significant paleontological resources would be reduced in sensitive wildlife habitats under Alternative A due to reduced development and access in these areas, compared to the Proposed Action. Reduced new access road construction (215 miles) would reduce access for both permitted and illegal vertebrate fossil collection, compared to the Proposed Action.	reduced density of development and fewer disturbance locations in DA 1 would further reduce adverse in this area impacts compared to the Proposed Action. Conversely, the potential to discover significant paleontological resources would be reduced in DA 1 due to the reduced level of development in this area, compared to the Proposed Action. Reduced new access road construction (205 miles) would reduce access for both permitted and illegal vertebrate fossil collection, compared to the Proposed Action.	reduced density of development, fewer disturbance locations, and a more clustered pattern of development in DA 1 would further reduce adverse in this area impacts compared to the Proposed Action. Conversely, the potential to discover significant paleontological resources would be reduced in DA 1 due to the reduced level of development in this area, compared to the Proposed Action. Reduced new access road construction (205 miles) would reduce access for both permitted and illegal vertebrate fossil collection, compared to the Proposed Action.
<b>Recreation</b>	Noise, visual intrusions, increased human activity, and other effects associated with the development of three wells per year, continued activities at existing wells, and the construction of 12	Increased direct impacts to recreation including short-term impacts from noise created during construction activities and short- and long-term impacts from alterations to the recreational setting from	Similar impacts to recreation as described for the Proposed Action, with the extent and severity of these impacts reduced in certain areas based on a reduced density of development in Sage-	Similar impacts to recreation as described for the Proposed Action, though to a lesser degree in the DA 1 area due to a reduced density of development, fewer disturbance locations, and	Similar impacts to recreation as described for the Proposed Action, though to a lesser degree in the DA 1 area due to a reduced density of development, fewer disturbance locations, more

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
	<p>miles of new access roads would result in limited and localized impacts to recreational opportunities and experiences.</p>	<p>natural gas wells, well pads, RGFs, pipelines, powerlines, and access roads from 6,340 acres of short-term and 1,890 acres of long-term surface disturbance and associated activity. Disturbance and project activity would alter the natural setting and affect the recreational user experience in certain areas and, at the full-field scale of the Proposed Action, could result in substantial loss of recreation opportunities compared to the No Action Alternative.</p>	<p>Grouse Winter Concentration Areas, surface disturbance thresholds in delineated habitat for focus species, and application of additional resource protection measures in delineated habitat for focus species in the DAs. Impacts to recreation settings and opportunities resulting from development phase activities would occur over a longer period (0.4 year longer) than the Proposed Action. However, fewer wells per year (an average of 14 fewer wells per year than the Proposed Action) could reduce the intensity of impacts compared to the Proposed Action. Phasing development across the Project Area would in a less widespread and more predictable pattern of development compared to the Proposed Action, which would reduce potential impacts on recreational activities.</p>	<p>reduced human activity in this area, compared to the Proposed Action. Impacts to recreation settings and opportunities resulting from development phase activities would occur over a longer period (0.4 year longer) than the Proposed Action. However, fewer wells per year (an average of 14 fewer wells per year than the Proposed Action) could reduce the intensity of impacts compared to the Proposed Action.</p>	<p>clustered pattern of development, and reduced human activity in this area, compared to the Proposed Action. Impacts to recreation settings and opportunities resulting from development phase activities would occur over a longer period (0.4 year longer) than the Proposed Action. However, fewer wells per year (an average of 14 fewer wells per year than the Proposed Action) could reduce the intensity of impacts compared to the Proposed Action. Phasing development and burying powerlines in Winter Concentration Areas would in a less widespread and more predictable impacts on recreational activities and settings in that area.</p>

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
<p><b>Socioeconomics – Social Factors</b></p>	<p>Creation of 14 new development and production jobs; however, these jobs are expected to be filled by current residents in the analysis area and no estimated increase in population or housing would occur.</p> <p>No anticipated impacts to quality of life, non-market values, or environmental justice communities due to relatively low level of development that is similar to existing conditions.</p>	<p>Creation of 954 new development and production jobs. An estimated 370 new workers would relocate to the region, resulting in an estimated regional population increase of 973 people that could be accommodated by the existing housing stock of Sublette and Sweetwater counties. Tax revenues generated by the project could have beneficial impacts on local communities by increasing funding for public services and education. These beneficial impacts would begin to decrease after the 10-year development period.</p> <p>Impacts on quality of life and non-market values could include changes in air quality, visual settings, increased traffic, diminished recreational settings, reduced real income from inflation, and potential increases in crime incidence. These impacts are not anticipated to</p>	<p>Fewer impacts on jobs than the Proposed Action as there would be 33 fewer production jobs throughout the life of the project. Approximately 9 percent fewer households would relocate to the project vicinity than under the Proposed Action, and growth-related social impacts, including impacts on housing, public services, and utilities would be proportionally less.</p> <p>Impacts to quality of life, non-market values, and environmental justice communities would be similar to the Proposed Action, but to a slightly lesser degree due to additional resource protection measures for sensitive wildlife habitats could reduce impacts to direct use and passive use nonmarket values associated with wildlife including hunting opportunities, wildlife viewing, and preservation of wildlife diversity and</p>	<p>Impacts on jobs, population, housing, and public services would be the same as for the Proposed Action.</p> <p>Impacts to quality of life, non-market values, and environmental justice communities would be similar to the Proposed Action, but to a slightly lesser degree due to increased emphasis on conserving a range of sensitive resources and considering landscape-scale impacts during planning for site-specific development.</p>	<p>Same as Alternative B Winter Concentration Area development scenario 1.</p>

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
		disproportionately affect environmental justice communities.	abundance for future generations.		
<b>Socioeconomics – Economic Factors</b>	Direct, indirect, and induced increases in jobs, labor income, and output in the region; however, given the low rate of well development and the percent of these effects in relation to the regional economy, these effects would be minimal. Fiscal impacts would continue consistent with historic trends.	<p>The development phase of the Proposed Action, during which the greatest economic effects would occur, would result in an approximate 10 percent increase in employment, a 6 percent increase in labor income, and an approximate 17 percent increase in economic output in the three-county region relative to baseline levels. These increases would provide a noticeable stimulus to the regional economy. Jobs and other economics effects may reduce after the 10-year development period when natural gas and condensate production is expected to decline.</p> <p>Projected project revenues would be at total of \$17,850 million. Impacts from substantial increases in available funding for public uses at the county and regional levels, and, to</p>	<p>Regional economic impacts resulting from development and production under Alternative B would be similar to the Proposed Action; however, the number of workers could fluctuate more during development due to geographic phasing and the use of a buried pipeline network that would reduce production-period staffing by an estimated 33 workers, resulting in an estimated decrease in annual labor income of \$5.5 million compared to the Proposed Action.</p> <p>Annual development phase economic impacts would be approximately 4 percent smaller than under the Proposed Action, but would extend over a slightly longer period (0.4 years longer than the Proposed Action).</p> <p>Fiscal impacts would be the same as the Proposed</p>	<p>Regional economic impacts resulting from development and production under Alternative B Winter Concentration Area development scenario 1 would be approximately the same as the Proposed Action.</p> <p>As under Alternative A, annual development phase economic impacts would be approximately 4 percent smaller than under the Proposed Action, but would extend over a slightly longer period (0.4 years longer than the Proposed Action).</p>	Same as Alternative B Winter Concentration Area development scenario 1.

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
		smaller extents, at the state and federal levels, compared to the No Action Alternative.	Action, except taxable purchases are expected to increase by \$4.3 million per year during the production period as a result of additional pipeline construction under Alternative A.		
<b>Soil Resources</b>	Adverse impacts to soils due to direct disturbance, compaction, mixing, and increased erosion potential from 213 acres of short-term surface disturbance and 79 acres of long-term disturbance could result in loss of soil productivity and erosion in limited and localized areas. Minimal impacts are anticipated due to the relatively low level of development.	Surface disturbance would impact soils to varying degrees depending on the amount, placement, and type of surface disturbance and the disturbed soil's characteristics. Soil impacts would from 6,340 acres of short-term surface disturbance and 1,890 acres of long-term surface disturbance include removal of soil and vegetation, bare soil, soil compaction, and undesirable mixing of soil horizons. These impacts could subsequently result in a loss of soil productivity, increased susceptibility of the soil to wind and water erosion, increased sedimentation and surface runoff, elevated salt loads in affected water resources, and the spread	Impacts to soils would be similar to those described for the Proposed Action, but the degree of impacts would be slightly more in the short term and slightly less in the long term compared to the Proposed Action due to a slight increase in short-term disturbance (6.4 percent) and a slight decrease in long-term disturbance (4.2 percent). The reduced density of development in Sage-Grouse Winter Concentration Areas and surface disturbance thresholds in delineated habitats for focus species would reduce impacts to soils in these areas compared to the Proposed Action. An average of 14 fewer wells would be developed	In general, adverse soil impacts for Alternative B Winter Concentration Area development scenario 1 would be similar to the Proposed Action, but the extent and degree of impacts would be decreased based on the decrease in surface disturbance (9.4 percent less in the short term, and 7.9 percent less in the long term), compared to the Proposed Action. The greatest decrease in surface disturbance relative to the Proposed Action would occur in DA 1, which would limit the potential for surface disturbance and resulting impacts to soils in this area compared to the Proposed Action. An average of 14 fewer wells would be developed	In general, adverse soil impacts for Alternative B Winter Concentration Area development scenario 2 would be similar to the Proposed Action, but the extent and degree of impacts would be decreased based on the decrease in surface disturbance (7.4 percent less in the short term, and 7.9 percent less in the long term), compared to the Proposed Action. The greatest decrease in surface disturbance relative to the Proposed Action would occur in DA 1, which would limit the potential for surface disturbance and resulting impacts to soils in this area compared to the Proposed Action. An average of 14 fewer wells would be developed

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
		of invasive species and noxious weeds. Short-term and long-term soil impacts would depend on the success of interim and final reclamation.	per year than the Proposed Action, resulting in slightly less soil impacts per year compared to the Proposed Action.	per year than the Proposed Action, resulting in slightly less soil impacts per year compared to the Proposed Action.	per year than the Proposed Action, resulting in slightly less soil impacts per year compared to the Proposed Action.
<b>Special Designations</b>	<p>Potential adverse impacts to the Sublette Cutoff and North Sublette Meadow Springs Variant if development and disturbance occurs within the three-mile viewshed of the trails.</p> <p>Limited potential for localized adverse impacts to the setting of the Wind River Front MA due to the relatively low level of development.</p> <p>Limited potential for localized adverse impacts to the setting of the Wind River Front MA due to the relatively low level of development.</p>	<p>Potential adverse impacts within the three-mile viewshed of the Sublette Cutoff and North Sublette Meadow Springs Variant from project-related activities that result in the introduction of visual elements that diminish the visual setting of the trails. Mitigation measure C-3 would reduce potential impacts to historic trails by requiring appropriate mitigation, agreement documents, and other considerations if potential impacts are identified during site-specific permitting.</p> <p>Potential for direct short- and long-term adverse impacts if surface disturbance occurs within the 444 BLM-administered acres of the Ross Butte MA</p>	<p>Adverse impacts from project-related activities within the three-mile viewshed of the Sublette Cutoff and North Sublette Meadow Springs Variant would be similar to the Proposed Action, but to a lesser degree due to prohibition of RGFs, compressor stations, and powerlines in delineated mountain plover habitat and raptor buffers in DA 3. Similar to the Proposed Action, mitigation measure C-3 would reduce potential impacts to historic trails by requiring appropriate mitigation, agreement documents, and other considerations if potential impacts are identified during site-specific permitting.</p> <p>Potential adverse impacts from project-related activities in the Ross Butte</p>	<p>Similar impacts to the Ross Butte MA as described for the Proposed Action, but to a lesser degree due to the reduced level of development in DA 1. Impacts to the three-mile viewshed of the Sublette Cutoff and North Sublette Meadow Springs Variant and Wind River MA would be as described for the Proposed Action. Similar to the Proposed Action, mitigation measure C-3 would reduce potential impacts to historic trails by requiring appropriate mitigation, agreement documents, and other considerations if potential impacts are identified during site-specific permitting.</p>	<p>Similar impacts to the Ross Butte MA as described for the Proposed Action, but to a lesser degree due to the reduced level of development in DA 1, and especially within Sage-Grouse Winter Concentration Areas. Impacts to the three-mile viewshed of the Sublette Cutoff and North Sublette Meadow Springs Variant and Wind River MA would be as described for the Proposed Action. Similar to the Proposed Action, mitigation measure C-3 would reduce potential impacts to historic trails by requiring appropriate mitigation, agreement documents, and other considerations if potential impacts are identified during site-specific permitting.</p>

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
		<p>overlapping the Project Area.</p> <p>Minimal potential for indirect impacts resulting from project-related development visible in the background views of the Project Area from the Wind River MA.</p>	<p>MA would be similar to the Proposed Action, but to a lesser degree due to limitations on the density of development for the protection of Sage-Grouse Winter Concentration Areas and delineated habitats for focus species in DA 1.</p> <p>Impacts to the Wind River MA would be as described for the Proposed Action.</p>		
<p><b>Transportation and Access</b></p>	<p>Development of 12 miles of new roads and an estimated 205 vehicle trips per day during full projection would have minimal impacts to transportation and access relative to baseline conditions.</p>	<p>Jonah Energy would develop 227 miles of new roads within the Project Area, which would enhance motorized access, primarily for natural gas and livestock operations. An estimated 1,284 daily vehicle trips per day during full production would increase vehicle traffic on roads used to access the Project Area. Traffic would increase by an estimated 11 percent on U.S. Highway 191, the primary road used to access the Project Area.</p> <p>The risk of approximately one to five additional traffic fatalities could result from</p>	<p>Jonah Energy would develop 215 miles of new roads within the Project Area, which would result in similar impacts as the Proposed Action, but to a slightly lesser degree. An estimated 1,163 daily vehicle trips per day during full production would result in similar impacts to vehicle traffic, traffic fatalities, and road maintenance as the Proposed Action, but slightly lesser degree.</p> <p>The phased development pattern for Alternative A could localize and concentrate new access road construction to the Phase that is being</p>	<p>Jonah Energy would develop 205 miles of new roads within the Project Area, which would result in similar impacts as the Proposed Action, but to a lesser degree.</p> <p>The total estimated number of vehicle trips per day and impacts on the transportation network would be similar to the Proposed Action; however, due to the reduced density of development in DA 1 traffic volumes, potential accidents, and road repair and maintenance on transportation routes within DA1, Winter Concentration Areas, and</p>	<p>Jonah Energy would develop 205 miles of new roads within the Project Area, which would result in similar impacts as the Proposed Action, but to a lesser degree.</p> <p>The total estimated number of vehicle trips per day and impacts on the transportation network would be similar to the Proposed Action; however, due to the reduced density of development in DA 1 and use of pipelines to transport produced water and condensate from RGFs within Sage-Grouse Winter Concentration Areas and PHMA to RGFs outside of</p>

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
		<p>the Proposed Action over approximately 40 years (life of the project). Existing roads may require more frequent maintenance due from project-related vehicle trips.</p>	<p>developed, compared to the Proposed Action, where new access roads could be constructed across the Project Area during the development period.</p>	<p>PHMAs may be reduced compared to the Proposed Action.</p>	<p>these areas, traffic volumes, potential accidents, and road repair and maintenance on transportation routes within DA1, Winter Concentration Areas, and PHMAs would be reduced compared to the Proposed Action, especially during the production phase.</p> <p>Within Winter Concentration Areas, phasing development from east to west would limit the potential for road development, maintenance, and project-related vehicle trips to be occurring across all Winter Concentration Areas at the same time. As a result, potential impacts on traffic, road conditions, and vehicle safety would be less widespread during the development phase than for the Proposed Action, where development could occur across Winter Concentration Areas throughout the development period.</p>

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
<b>Vegetation</b>	<p>The majority of estimated surface disturbance would occur within the sagebrush-steppe community (140 acres of short-term disturbance and 52 acres of long-term disturbance). Loss and fragmentation of vegetation communities, risk of invasive species spread, and potential destruction of special status plant species would be relatively minor in proportion to the total size of existing vegetation communities in the Project Area.</p>	<p>The majority of estimated surface disturbance would occur within the sagebrush-steppe community (4,177 acres of short-term disturbance and 1,245 acres of long-term disturbance), followed by the Great Basin Saltbush Scrub community (1,704 acres of short-term disturbance and 508 acres of long-term disturbance). These disturbances would result in loss and fragmentation of vegetation communities, risk of invasive species spread, and potential destruction of special status plant species, especially in areas outside of Sage-Grouse PHMA, which would have the highest densities of disturbance.</p>	<p>Similar impacts as described for the Proposed Action, but varying in extent and location based on surface disturbance, resource protection measures for sensitive wildlife habitat, geographic phasing of development, and the slower annual rate of development. Interim reclamation required after each development phase would decrease the total maximum amount of short-term surface disturbance and area of cleared vegetation at any given time, compared to the Proposed Action.</p> <p>The majority of estimated surface disturbance would occur within the sagebrush-steppe community (4,166 acres of short-term disturbance and 1,193 acres of long-term disturbance), followed by the Great Basin Saltbush Scrub community (1,700 acres of short-term</p>	<p>Similar impacts as described for the Proposed Action, but varying in extent and location based on a slower annual rate of development and changes in surface disturbance from reductions in the density of development and number of surface disturbance locations in DA 1.</p> <p>The majority of estimated surface disturbance would occur within the sagebrush-steppe community (3,783 acres of short-term disturbance and 1,147 acres of long-term disturbance), followed by the Great Basin Saltbush Scrub community (1,543 acres of short-term disturbance and 468 acres of long-term disturbance).</p>	<p>Similar impacts as described for the Proposed Action, but varying in extent and location based on a slower annual rate of development and changes in surface disturbance from reductions in the density of development and number of surface disturbance locations in DA 1.</p> <p>Additionally, impacts to vegetation communities would be less widespread due to the phased pattern of development in Winter Concentration Areas.</p> <p>The majority of estimated surface disturbance would occur within the sagebrush-steppe community (3,870 acres of short-term disturbance and 1,147 acres of long-term disturbance), followed by the Great Basin Saltbush Scrub community (1,579 acres of short-term disturbance and 468 acres of long-term disturbance).</p>

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
			disturbance and 487 acres of long-term disturbance).		
<b>Visual Resources</b>	Direct, adverse impacts on visual resources would result from 213 acres of estimated short-term surface disturbance and 79 acres of long-term surface disturbance in the Project Area by creating line, form, color, and texture contrasts. Due to the relatively small percentage of the Project Area that would have surface disturbance, adverse impacts on the visual setting within the Project Area or sensitive viewing locations in the analysis area would be minor and localized.	<p>The Proposed Action would result in direct adverse impacts on visual resources from 6,340 acres of short-term surface disturbance (4.5 percent of the Project Area) and 1,890 acres of long-term surface disturbance (1.3 percent of the Project Area), including development and operations of new natural gas facilities that modify the natural visual characteristics of the landscape in the Project Area by creating line, form, color, and texture contrasts.</p> <p>Construction activities would result in adverse impacts on visual resources from construction vehicles, human activity, other construction-related activities, and fugitive dust generation.</p> <p>Vegetation changes and the introduction of invasive plant species from project-related activities could</p>	<p>Similar impacts to visual resources as under the Proposed Action, with the extent and severity of these impacts reduced in delineated habitat for focus species based on the reduced densities of development, surface disturbance thresholds in delineated habitat for focus species, and application of additional resource protection measures these areas, compared to the Proposed Action.</p> <p>Alternative A could create additional line, form, color, and texture contrasts on the 424 acres of surface disturbance outside of the Project Area for a buried pipeline to transport produced water and condensate to sales points.</p>	<p>Similar impacts to visual resources as under the Proposed Action, but to a lesser degree in the DA 1 area. Compared to the Proposed Action, the DA 1 area would have a decreased density of development, reduced short-term and long-term surface disturbance, and less miles of new access roads and pipelines.</p>	<p>Similar impacts to visual resources as under the Proposed Action, but to a lesser degree in the DA 1 area. Compared to the Proposed Action, the DA 1 area would have a decreased density of development, reduced short-term and long-term surface disturbance, less miles of new access roads and pipelines, and more clustered pattern of development, especially within Winter Concentration Areas.</p> <p>Burying powerlines in Winter Concentration Areas, where feasible, would reduce long-term visual impacts from new form, line, color, and texture contrasts that would result from overhead powerlines, compared to the Proposed Action.</p>

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
		increase the frequency and severity of wildland fires that would affect visual resources.			
<b>Water Resources – Surface Water</b>	Potential stream channel alterations from linear crossings of ephemeral drainages by new well access roads, surface water quality impacts from accidental spills or releases, and increased sedimentation rates to drainages within the analysis area. However, the relatively low level of development is not anticipated to notably alter surface water quality or quantity relative to baseline conditions.	Potential impacts to surface waters, including direct and indirect alterations of ephemeral drainages from road and pipeline crossings; accidental spills of completion fluids, drilling fluids, and formation fluids; and, on and off-site degradation of surface water quality from sedimentation, turbidity and salinity.	Similar impacts as described for the Proposed Action, but the extent and degree of impacts would be slightly more in the short term and slightly less in the long term, based on the difference in estimated surface disturbance and resulting impacts on runoff, erosion, sedimentation, and other surface water impacts. The phased development pattern of Alternative A could result in more localized impacts to certain watersheds. The buried pipeline network under Alternative A would reduce the potential for accidental spills and releases to surface waters when compared to the Proposed Action, but would increase pipeline crossings at ephemeral drainages while also increasing the potential for seepage and spills and the time required	Similar impacts as described for the Proposed Action, though potentially reduced impacts in DA 1. A reduced density of development and surface disturbance in DA 1 would reduce potential impacts to surface water quality from increased erosion, sediment loads, and storm water runoff in this area, compared to the Proposed Action. The potential for hazardous materials and formation fluids spills to affect surface water quality would be similar to the Proposed Action.	Similar impacts as described for the Proposed Action, though potentially reduced impacts in DA 1. A reduced density of development and surface disturbance in DA 1, especially within Winter Concentration Areas, would reduce potential impacts to surface water quality from increased erosion, sediment loads, and storm water runoff in this area, compared to the Proposed Action. The potential for hazardous materials and formation fluids spills to affect surface water quality would be similar to the Proposed Action, but potentially greater in localized areas where pipelines would be buried constructed between RFGs within and on the perimeter of Winter Concentration Areas and PHMA.

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
			to detect and fix underground leaks.		
<b>Water Resources – Groundwater</b>	<p>The No Action Alternative would result in an estimated groundwater withdrawal of 43,543 bbls (5.6 acre-feet) per year during the development phase for dust control, drilling, completions, and hydrostatic testing. An additional 7,200 bbls (0.9 acre-feet) of groundwater would be withdrawn during each year of the production phase for road maintenance dust control. Due to the relatively low level of water use, minimal impacts are anticipated.</p> <p>There would be no underground injection of produced water and no potential impacts to groundwater quality resulting from injection of produced water.</p>	<p>Withdrawal of up to 474.0 acre-feet of groundwater per year during the 10-year development phase and 17.6 acre-feet per year during the 30-year production phase would be a permanent removal of water from the upper Wasatch aquifer and result in lowering of the potentiometric surface. Lowered potentiometric surface resulting from these withdrawals would be greatest within a few miles of water wells, and would be expected to recover in less than six years. The vertical separation and lack of permeable connections between zones of low quality water and the Wasatch extraction zone suggest that there is a very low likelihood of adverse impacts to water quality in the Wasatch Aquifer due to groundwater withdrawal for the Proposed Action.</p>	<p>For Alternative A, impacts resulting from groundwater withdrawal would be similar to those described for the Proposed Action, though slightly less during each year of the development period due to the estimated 3.6 percent decrease in annual groundwater use during the development phase and a 5.7 percent decrease in annual groundwater use during the production phase.</p> <p>The differences in total groundwater use during the development phase (0.3 percent more than the Proposed Action) and production phase (5.7 percent less than the Proposed Action) are not anticipated to notably change impacts, compared to the Proposed Action.</p> <p>As described for the Proposed Action, no adverse water quality impacts are anticipated from the disposal of</p>	<p>Impacts resulting from groundwater withdrawal would be similar to the Proposed Action, though slightly less due to the estimated 4.0 percent decrease in annual groundwater use during the development phase and a 9.7 percent decrease in annual groundwater use during the production phase, compared to the Proposed Action.</p> <p>The differences in total groundwater use during the development phase (0.1 percent less than the Proposed Action) and production phase (9.7 percent less than the Proposed Action) are not anticipated to notably change impacts, compared to the Proposed Action.</p> <p>As described for the Proposed Action, no adverse water quality impacts are anticipated from the disposal of formation fluids in</p>	<p>Impacts resulting from groundwater withdrawal would be similar to the Proposed Action, though slightly less due to the estimated 4.0 percent decrease in annual groundwater use during the development phase and a 9.7 percent decrease in annual groundwater use during the production phase, compared to the Proposed Action.</p> <p>The differences in total groundwater use during the development phase (0.1 percent less than the Proposed Action) and production phase (9.7 percent less than the Proposed Action) are not anticipated to notably change impacts, compared to the Proposed Action.</p> <p>As described for the Proposed Action, no adverse water quality impacts are anticipated from the disposal of formation fluids in</p>

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
		<p>No adverse water quality impacts are anticipated from the disposal of formation fluids in underground injection wells because it is unlikely that hydraulic connections that would allow upward migration of formation fluids between the upper Fort Union Formation (used for injection) and Upper Wasatch Aquifer.</p>	<p>formation fluids in underground injection wells.</p>	<p>underground injection wells.</p>	<p>underground injection wells.</p>
<p><b>Wild Horses</b></p>	<p>Minor and localized adverse impacts to wild horses due to the relatively small percentage of the Project Area disturbed.</p>	<p>Potential impacts to wild horses include the loss of available forage or habitat components resulting from surface disturbances in the Little Colorado HMA. Direct and indirect impacts would be greatest in 23 percent of the Little Colorado HMA not overlapping Sage-Grouse PHMA, where the density of development would be an average of four well pads per 640-acre area. Increased potential for vehicle/wild horse collisions and displacement associated with increased traffic, compared to the No Action Alternative.</p>	<p>Similar impacts as described for the Proposed Action, but the degree of impacts would be less due to a reduced density of development in delineated habitat for focus species that overlap the Little Colorado HMA, prohibition of certain facilities in areas that overlap the HMA, geographic phasing of development, and slower annual rate of development. In addition, for Alternative A, RGFs, compressor stations, and powerlines would be prohibited within raptor nest buffers in DA 3 and DA 5 and within mountain</p>	<p>Alternative B would result in similar impacts as described for the Proposed Action, as the density of development, surface disturbance, and other project-related activity in the Little Colorado HMA portion of the Project Area is expected to be the same as the Proposed Action.</p>	<p>Except for localized, short-term impacts from buried pipeline construction to RGFs in PHMA and the slower rate of development, Alternative B Winter Concentration Area development scenario 2 would result in similar impacts as described for the Proposed Action, as the density of development, surface disturbance, and other project-related activity in the Little Colorado HMA portion of the Project Area is expected to be the same as the Proposed Action.</p>

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
			plover habitat for DA 3, which may further reduce surface disturbance and human activity in these portions of the HMA, compared to the Proposed Action.		
<b>Wildlife – General</b>	The relatively low level of development under the No Action Alternative is unlikely to substantially alter the condition or availability of habitats utilized by wildlife in comparison to baseline conditions.	Potential direct impacts on wildlife species from 6,340 acres of short-term surface disturbance and 1,890 acres of long-term surface disturbance (including 227 miles of new roads) that would cause habitat loss and fragmentation. Additional adverse effects would occur from increased avoidance by and displacement of individuals and groups due to human activity and decreased habitat quality, increased risk of wildlife/vehicle collisions, and poisoning from ingestion of chemicals. In general, impacts to wildlife species would be greatest outside of Sage-Grouse PHMA, where the density of development would be an average of	Similar impacts as described for the Proposed Action, but to a lesser degree due to 4.2 percent decrease in long-term surface disturbance; prohibiting overhead powerlines across 43,025 acres including within raptor nest buffers, burrowing owl nest buffers, and delineated mountain plover habitat; and installing bottomless culverts and silt fences under roadways. Resource protection measures in Sage-Grouse Winter Concentration Areas such as prohibiting development in areas containing greater than 5 percent sagebrush canopy cover in DA 1 would confer beneficial impacts to wildlife species that utilize sagebrush habitat.	Similar impacts as described for the Proposed Action, but to a lesser degree due to a 7.9 percent decrease in long-term surface disturbance compared to the Proposed Action and by reducing the density of development in DA 1, which would reduce adverse impacts to wildlife utilizing this area, compared to the Proposed Action. An estimated 22 fewer miles of new access roads would reduce the potential for collisions with wildlife compared to the Proposed Action, especially within DA 1.	Similar impacts as described for the Proposed Action, but to a lesser degree due to a 7.9 percent decrease in long-term surface disturbance compared to the Proposed Action and by reducing the density of development in DA 1, which would reduce adverse impacts to wildlife utilizing this area, compared to the Proposed Action. An estimated 22 fewer miles of new access roads and reduced vehicle traffic in Winter Concentration Areas and PHMAs during the production phase would reduce the potential for collisions with wildlife compared to the Proposed Action. However, certain roads outside of these areas would have more vehicle traffic relative to

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
		four well pads per 640-acre area.	An estimated 12 fewer miles of new access roads would reduce the potential for collisions with wildlife compared to the Proposed Action.		the Proposed Action, and would therefore result in a greater collision hazard.
<b>Wildlife – Big Game</b>	Potential adverse impacts to big game species due to habitat loss and degradation and human presence, but no notable alternations to baseline population trends and habitat conditions are anticipated due to the relatively low level of development and because the area has already been substantially disturbed through previous and ongoing development.	<p>Potential direct impacts to moose, elk, mule deer, and pronghorn include mortalities from vehicular collisions from increased traffic on existing roads and 227 miles of new access roads, and poisoning from chemicals. Numerous potential indirect impacts, including habitat loss, fragmentation, increased avoidance by and displacement of individuals and groups, decreased habitat quality, and migration disruptions would occur.</p> <p>All big game populations would continue to fluctuate based on natural factors, but pronghorn and mule deer populations could face permanent displacement from seasonal habitat and disruption of migration routes, especially in areas outside of Sage-Grouse</p>	Similar impacts as described for the Proposed Action, but to a lesser degree due to a 4.2 percent decrease in long-term surface disturbance compared to the Proposed Action, limiting the density of development and reduced surface disturbance in pronghorn crucial winter range in DAs 2 and 6, and limiting the density of development in Winter Concentration Areas for Sage-Grouse in DA 1. Density of development could still result in displacement of big game from seasonal habitat during the development phase, especially in DA 4 where pronghorn is not identified as a focus species and no additional protections are provided.	Similar impacts as described for the Proposed Action, but to a lesser degree due to a 7.9 percent decrease in long-term surface disturbance compared to the Proposed Action. A lower density of development, less short-term and long-term surface disturbance, and less human activity (e.g., noise, traffic) in the DA 1 area, would reduce impacts to big game habitat and migration routes in this area, compared to the Proposed Action. Alternative B Winter Concentration Area development scenario 1 would result in a similar density of disturbance as the Proposed Action in pronghorn crucial winter range and pronghorn migration routes and	Similar impacts as described for the Proposed Action, but to a lesser degree due to a 7.9 percent decrease in long-term surface disturbance compared to the Proposed Action. A lower density of development, less short-term and long-term surface disturbance, a more clustered pattern of development, and less human activity (e.g., noise, traffic) in the DA 1 area, especially within Winter Concentration Areas, would reduce impacts to big game habitat and migration routes in this area, compared to the Proposed Action. Alternative B Winter Concentration Area development scenario 2 would result in a similar density of disturbance as the Proposed Action in

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
		PHMA that has the greatest density of development.	An estimated 12 fewer miles of new access roads would reduce the potential for disturbance and collisions with big game compared to the Proposed Action.	similar adverse impacts are expected. An estimated 22 fewer miles of new access roads would reduce the potential for disturbance and collisions with big game compared to the Proposed Action.	pronghorn crucial winter range and pronghorn migration routes and similar adverse impacts are expected. An estimated 22 fewer miles of new access roads would reduce the potential for disturbance and collisions with big game compared to the Proposed Action.
<b>Wildlife – Raptors</b>	The relatively low level of development under the No Action Alternative, which would not include new powerlines that provide perches for avian predators, is unlikely to substantially alter the condition or availability of habitats utilized by raptors from baseline conditions.	Potential direct impacts to raptors include mortalities from vehicular collisions from increased traffic on existing roads and 227 miles of new access roads, poisoning and/or tank and trench entrapment, and potential collision with 38.6 miles of powerlines. Numerous potential indirect adverse impacts related to loss and fragmentation of nesting and foraging habitat would likely result in raptor population declines in the Project Area. Adverse impacts would be greatest in areas outside of Sage-Grouse PHMA, where the	Similar impacts as described for the Proposed Action, but to a lesser degree due to a 4.2 percent reduction in surface disturbance, prohibiting overhead powerlines, RGFs, and compressor facilities within delineated raptor nest buffers in DAs 1, 3, and 5 (40,331 acres) which would reduce potential for collisions and electrocution and overall surface disturbance in raptor nest buffers. Additional reduction of impacts in areas where raptor foraging, wintering, or nesting habitat overlaps focus species habitat compared to the Proposed	Similar impacts as described for the Proposed Action, but to a lesser degree due to a 7.9 percent decrease in long-term surface disturbance compared to the Proposed Action and reduction in the density of development, amount of surface disturbance, habitat fragmentation, and human activity where raptors are most prevalent in DA 1.	Similar impacts as described for the Proposed Action, but to a lesser degree due to a 7.9 percent decrease in long-term surface disturbance compared to the Proposed Action and reduction in the density of development, amount of surface disturbance, habitat fragmentation, and human activity where raptors are most prevalent in DA 1. Phasing development across Winter Concentration Areas would further reduce fragmentation of raptor

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
		densities of would be highest.	Action. Phased development would reduce development pressure in raptor nesting areas during sensitive periods.		habitats in that area during the development phase. Burying powerlines in Winter Concentration Areas, where feasible, would reduce electrocution hazards and may reduce predatory success.
<b>Wildlife – Fisheries</b>	Due to the relatively low level of development and associated surface disturbance, potential indirect impacts to downstream fisheries from sedimentation would not notably change from baseline conditions. The No Action Alternative would result in an estimated withdrawal of 5.6 acre-feet of groundwater per year during the development phase and 0.9 acre-feet of groundwater per year during the full production phase.  Given the relatively low level of development for the No Action Alternative, these groundwater withdrawals are not anticipated to notably alter the population trends and	Potential indirect impacts on fish and fisheries outside, but hydrologically-connected to, the Project Area could result from project-related activities that result in increased sedimentation and salinity of surface waters and groundwater depletions, including an estimated 1,890 acres of long-term surface disturbance under the Proposed Action.  Potential indirect adverse impacts to fisheries habitat associated with the use of 474.0 acre-feet per year of water for dust control, drilling, completions, and hydrostatic testing during the 10-year development phase and an additional 17.6 acre-feet per year for dust control during the production phase, which	Similar impacts as described for the Proposed Action but to a lesser degree due to the 4.2 percent less long-term surface disturbance and associated reduction in downstream sedimentation compared to the Proposed Action.  Compared to the Proposed Action, Alternative A would use approximately 3.6 percent less groundwater per year during the development phase and 5.7 percent less groundwater per year during the production phase, resulting in proportionately reduced impacts from water depletions each year.	Similar impacts as described for the Proposed Action, but to a lesser degree due to a 7.9 percent decrease in long-term surface disturbance, resulting in a reduced potential for adverse indirect impacts to water quality, erosion, and sedimentation compared to the Proposed Action.  Compared to the Proposed Action, Alternative B Winter Concentration Area development scenario 1 would use approximately 4.0 percent less groundwater per year during the development phase and 9.7 percent less groundwater per year during the production phase, resulting in proportionately reduced	Similar impacts as described for the Proposed Action, but to a lesser degree due to a 7.9 percent decrease in long-term surface disturbance, resulting in a reduced potential for adverse indirect impacts to water quality, erosion, and sedimentation compared to the Proposed Action.  Compared to the Proposed Action, Alternative B Winter Concentration Area development scenario 2 would use approximately 4.0 percent less groundwater per year during the development phase and 9.7 percent less groundwater per year during the production phase, resulting in proportionately reduced

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
	habitat conditions for other fish and fisheries from the baseline conditions.	would contribute to water depletions. Additional potential impacts include increases in erosion, sedimentation, and salinity of surface waters in the Project Area and downstream areas.		impacts from water depletions.	impacts from water depletions.
<b>Wildlife – Special Status Species</b>	The relatively low level of development under the No Action Alternative is unlikely to substantially alter the condition or availability of habitats utilized by special status wildlife species in comparison to baseline conditions.	<p>The only potentially affected federally-listed species are the Colorado River fish species (Colorado pikeminnow, razorback sucker, bonytail chub, and humpback chub). Potential impacts to these species would be similar to those described above for Wildlife – Fisheries.</p> <p>Potentially affected BLM Wyoming Sensitive Species include the Greater Sage-Grouse, pygmy rabbit, white-tailed prairie dog, long-eared myotis, various raptor species, long-billed curlew, mountain plover, other avian species, and the flannel mouth sucker.</p> <p>Impacts to these species would include habitat loss and degradation from project-related</p>	<p>Similar impacts as described for the Proposed Action, but to a lesser degree due to 4.2 percent decrease in long-term surface disturbance; prohibiting overhead powerlines across 43,025 acres including within raptor nest buffers, burrowing owl nest buffers, and delineated mountain plover habitat; and installing bottomless culverts and slit fences under roadways.</p> <p>Resource protection measures in Sage-Grouse Winter Concentration Areas such as prohibiting development in areas containing greater than 5 percent sagebrush canopy cover in DA 1 would confer beneficial impacts to special status wildlife</p>	<p>Similar impacts as described for the Proposed Action, but to a lesser degree due to a 7.9 percent decrease in long-term surface disturbance compared to the Proposed Action and by reducing the density of development in DA 1, which would reduce adverse impacts to special status wildlife species utilizing this areas compared to the Proposed Action.</p> <p>An estimated 22 fewer miles of new access roads and reduced vehicle traffic, primarily within DA 1, would reduce the potential for collisions with wildlife compared to the Proposed Action.</p>	<p>Similar impacts as described for the Proposed Action, but to a lesser degree due to a 7.9 percent decrease in long-term surface disturbance compared to the Proposed Action and by reducing the density of development in DA 1, which would reduce adverse impacts to special status wildlife species utilizing this areas compared to the Proposed Action.</p> <p>An estimated 22 fewer miles of new access roads and reduced vehicle traffic in Winter Concentration Areas and PHMAs during the production phase would reduce the potential for collisions with wildlife compared to the Proposed Action. However, certain roads outside of these</p>

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
		<p>development and human activity, as well as potential for direct mortality from construction activities, collisions with vehicles, and chemical poisoning.</p> <p>In general, impacts to wildlife species would be greatest outside of Sage-Grouse PHMA, where the density of development would be an average of four well pads per 640-acre area. Impacts to Colorado River fish species would be mitigated through payment of a depletion charge to the Upper Colorado River Endangered Fish Recovery Program.</p>	<p>species that utilize sagebrush habitat.</p> <p>An estimated 12 fewer miles of new access roads would reduce the potential for collisions with wildlife compared to the Proposed Action.</p>		<p>areas would have more vehicle traffic relative to the Proposed Action, and would therefore result in a greater collision hazard.</p>
<p><b>Wildlife – Greater Sage-Grouse</b></p>	<p>Habitat disturbance, noise, and ongoing human presence could adversely impact Sage-Grouse; however, the relatively low level of development under the No Action Alternative and application of the Sage-Grouse management decisions and the application of conservation measures described in the BLM Wyoming Sage-Grouse</p>	<p>Potential impacts to Sage-Grouse include mortalities due to vehicle collisions, accidental poisoning, tank and trench entrapment, collision with wire enclosure fences, decrease in chick survival rates due to noise and human activity, decreased quantity and quality of suitable habitat, increased avoidance and</p>	<p>Similar impacts as described for the Proposed Action, but to a lesser degree due to 4.2 percent less long-term surface disturbance, additional resource protection measures, prohibiting powerlines in raptor buffers and delineated mountain plover habitat in DAs 1 and 3, and phasing of development within PHMA.</p>	<p>Similar impacts as described for the Proposed Action, but to a lesser degree due to reduced density of development and an estimated 7.9 percent less long-term surface disturbance than the Proposed Action, primarily in the DA 1 area, which overlaps the majority of Winter Concentration Area.</p>	<p>Similar impacts as described for the Proposed Action, but to a lesser degree due to reduced density of development and an estimated 7.9 percent less long-term surface disturbance than the Proposed Action, primarily in the DA 1 area, which overlaps the majority of Winter Concentration Area.</p>

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
	<p>RMP Amendments (BLM 2015e) would limit the severity of these adverse impacts.</p>	<p>displacement, increased habitat fragmentation, increased predation, and decreased insect availability.</p> <p>Per the BLM Wyoming Sage-Grouse RMP Amendments (BLM 2015e), density of development and surface disturbance thresholds would be reduced in Sage-Grouse PHMA; however, disturbance in Sage-Grouse PHMA could still result in increased adverse impacts to Sage-Grouse compared to the No Action Alternative.</p> <p>The density of development and surface disturbance would be higher in Winter Concentration Areas (higher than PHMA), which could lead to displacement of Sage-Grouse from Winter Concentration Areas. In addition, Sage-Grouse wintering areas that are not within delineated Winter Concentration Areas would not have the timing</p>	<p>Alternative A would also limit the density of development and apply surface disturbance thresholds in Winter Concentration Areas and provide for additional resources protection measures in DA 1 which would reduce direct and indirect impacts to Sage-Grouse (e.g., poisoning, tank/trench entrapment) in Winter Concentration Areas, compared to the Proposed Action.</p> <p>Short-term surface disturbance in Sage-Grouse PHMA would be greater than under Alternative A than under the Proposed Action due to the buried condensate and produced water pipeline; however this action would reduce the number and frequency of vehicle trips and the potential for vehicle collisions as compared to the Proposed Action.</p> <p>Potential impacts to Sage-Grouse in wintering areas that are outside delineated</p>	<p>Direct and indirect impacts to Sage-Grouse (e.g., collisions, tank/trench entrapment) would be greatest in DA 2 which would have the highest density of development.</p> <p>Potential impacts to Sage-Grouse in wintering areas that are outside delineated Winter Concentration Areas would be similar to the Proposed Action, but reduced in DA 1 due to the reduced density of development in this area, compared to the Proposed Action.</p>	<p>In addition to the reduced density of development in DA 1, Sage-Grouse Winter Concentration Areas would have a surface disturbance threshold of 5 percent disturbance per 640 acres and above-ground facilities would be centralized outside of Winter Concentration Areas. As a result, Alternative B Winter Concentration Area development scenario 2 would result in reduced surface disturbance, fewer disturbance locations, and a more clustered pattern of development in these areas, compared to the Proposed Action.</p> <p>Development would also be phased from east to west in Winter Concentration Areas, reducing the total amount of disturbance and rate of habitat fragmentation in Winter Concentration Areas during the development phase, compared to the Proposed Action. Burying powerlines, where feasible in Winter Concentration</p>

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
		<p>stipulation afforded to delineated Winter Concentration Areas and wintering Sage-Grouse that use these areas could be displaced year-round.</p> <p>An estimated 38.6 miles of new powerlines would increase raptor perching locations and potential predation of Sage-Grouse. However, in accordance with the BLM Wyoming Sage-Grouse RMP Amendments, powerlines would be buried where feasible in PHMA, and where not feasible to bury, overhead lines would include appropriate design and mitigation to reduce potential impacts to Sage-Grouse.</p>	<p>Winter Concentration Areas would be similar to the Proposed Action, but reduced in areas where wintering areas overlap delineated habitat for focus species due to the surface disturbance threshold in these areas.</p>		<p>Areas would reduce potential impacts to Sage-Grouse from raptor predation in these areas, compared to the Proposed Action.</p> <p>Direct and indirect impacts to Sage-Grouse (e.g., collisions, tank/trench entrapment) would be greatest in DA 2 which would have the highest density of development.</p> <p>The construction of buried pipelines to transport produced water and condensate to RGFs outside of PHMA and Winter Concentration Areas could result in additional adverse impacts to Sage-Grouse in the short-term until the construction activity is complete and disturbance is successfully reclaimed. However, the use of buried pipelines to transport produced water and condensate to RGFs outside of Winter Concentration Areas and PHMA would reduce potential long-term adverse impacts from noise, activity, and</p>

**Table ES-2. Summary of Impacts for the Alternatives**

Resource	No Action	Proposed Action	Alternative A	Alternative B Winter Concentration Area Development Scenario 1 (Preferred Alternative)	Alternative B Winter Concentration Area Development Scenario 2 (Preferred Alternative)
					<p>collisions due to heavy truck trips in PHMA and Winter Concentration Areas during the production phase, compared to the Proposed Action.</p> <p>Potential impacts to Sage-Grouse in wintering areas that are outside delineated Winter Concentration Areas would be similar to the Proposed Action, but reduced in DA 1 due to the reduced density of development in this area, compared to the Proposed Action.</p>

AUM animal unit month  
 bbl barrel  
 BCF billion cubic feet  
 BLM Bureau of Land Management  
 DA Development Area  
 DAT Deposition Analysis Threshold  
 dBA A-weighted decibels  
 GHG greenhouse gas  
 HAP hazardous air pollutant  
 HMA Herd Management Area  
 MA Management Area

MMCF million cubic feet  
 NAAQS National Ambient Air Quality Standards  
 NO<sub>x</sub> Oxides of nitrogen  
 NPL Normally Pressured Lance  
 PHMA Priority Habitat Management Area  
 PM<sub>10</sub> Coarse particulate matter  
 RGF Regional Gathering Facility  
 RMP Resource Management Plan  
 ROW Right-of-way  
 UGRB Upper Green River Basin  
 WAAQS Wyoming Ambient Air Quality Standards

## Cumulative Impacts

Chapter 4 (*Environmental Consequences*) of the EIS analyzes the cumulative impacts to specific resource values and uses that could occur from implementation of the Proposed Action and alternatives, in conjunction with other impacts from past, ongoing, and reasonably foreseeable future actions (RFAs). As indicated in the BLM NEPA Handbook (H-1790-1), the purpose of the cumulative impacts analysis is to ensure that Federal decision-makers consider the full range of consequences for the Proposed Action, alternatives to the Proposed Action, and the No Action Alternative.

The geographic scope of Cumulative Impact Analysis Areas (CIAAs) vary by resource and is larger for resources that are mobile or migrate as compared to those that are stationary. The timeframe for the cumulative impacts analysis for each resource is based on the duration of the short-term and long-term, direct and indirect impacts of the Proposed Action, alternatives to the Proposed Action, and the No Action Alternative. In some cases the cumulative impacts analysis timeframe for certain resources is longer than the 40-year life of the NPL Project to encompass residual effects and impacts that last beyond the life of the project.

The primary type of past action relevant to the cumulative impacts analysis is oil and gas development in the region. Historic and existing oil and gas development within the region surrounding the NPL Project is widespread and varied and includes some of the largest and most productive natural-gas fields in the United States (WyoHistory 2013). Major oil and gas development projects affecting the existing condition of resources in and around the Project Area include the JIDPA Natural Gas Development Project, and the Pinedale Anticline Oil and Gas Project.

Ongoing and RFAs within the CIAA of each resource are varied and widespread, and consist of oil, natural gas, and mineral exploration and development projects, pipeline and transmission line construction, wind energy development, industrial and utility projects, transportation improvements, habitat improvement projects, and resource management actions. Ongoing and RFAs most likely to contribute to cumulative impacts include various oil and gas development projects (Pinedale Anticline Oil and Gas Exploration & Development Project, Jonah Infill Development Project, Bird Canyon Natural Gas Development Project, Dry Piney Deep Project, Lander Peak Area Exploratory Proposal, Riley Ridge Unit Development Project, Rands Butte Gas Development Project, and Moxa Arch/Blacks Fork Area Infill Gas Development Project), electric transmission infrastructure (Gateway West Transmission Line Project, Paradise 230 kV transmission line, and Jonah Substation), the Riley Ridge Pipeline Project, and increased density of development resulting from potential conversion of portions the Project Area to intensively developed fields (IDFs). These ongoing and RFAs would result in surface disturbance, habitat fragmentation, visual impacts, noise, and human activity that could contribute to adverse cumulative impacts to resources or restrict the availability or quality of lands available for other resource uses.

Although much of the analysis focuses on adverse cumulative impacts, it should be noted that cumulative impacts may also be beneficial. For example, there are beneficial cumulative economic effects of oil and gas development, including additional employment opportunities in the region, additional tax revenues to local governments, and increased royalties to the federal government.

Additionally, projects such as the Wyoming Land Trust Fence Modification Projects and Wyoming Range Mule Deer Habitat Improvement Project could improve habitat quality and connectivity for mule deer populations in the region, potentially offsetting certain adverse impacts to mule deer from the NPL Project.

## Appropriate Additional Mitigation

This section describes the proposed mitigation strategy to avoid, minimize, and rectify/restore impacts resulting from the NPL Project and identifies the remaining residual effects that may warrant appropriate additional mitigation during site-specific permitting. Appropriate additional mitigation that the BLM may consider during site-specific permitting is primarily based on management goals and objectives in applicable BLM RMPs, the State of Wyoming's Revised Greater Sage-Grouse Compensatory Mitigation Framework (State of Wyoming 2017), and the MOU among the BLM, State of Wyoming, and other federal agencies on Promoting a Cohesive and Consistent Conservation Strategy for the Greater Sage-Grouse and its Habitat in Wyoming (DOI et al. 2017), or more current guidance as it is adopted.

Following the assessment of the potential impacts that could remain after application of the avoidance, minimization, and rectification/restoration measures included in the NPL Project mitigation strategy in Appendix N (*Mitigation Determination*), the BLM identified the following potential residual impacts that may warrant appropriate additional mitigation during site-specific permitting. All additional mitigation for Sage-Grouse would be consistent with the *State of Wyoming's Revised Greater Sage-Grouse Compensatory Mitigation Framework* (State of Wyoming 2017) and the MOU among the BLM, State of Wyoming, and other federal agencies *on Promoting a Cohesive and Consistent Conservation Strategy for the Greater Sage-Grouse and its Habitat in Wyoming* (DOI et al. 2017), or more current guidance as it is adopted.

### Sage-Grouse

**Residual Effect: *Decreased Quantity and Quality of Sage-Grouse Habitat including Habitat in PHMA and Winter Concentration Areas.*** The NPL Project could result in decreased quantity and quality of suitable breeding, wintering, and foraging habitat for Sage-Grouse, resulting from surface disturbance, vegetation clearing, and other project-related activity during the 10-year development phase and from long-term facilities that would persist during the duration of the 30-year production phase (e.g., RGFs). These impacts could persist until interim and final reclamation are successful. Due to the prolonged time required to successfully reclaim and re-establish high quality, mature sagebrush habitat with vertical and horizontal structural diversity, these impacts could persist for up to 40 years (Goodrich 2005) or for as long as it takes sagebrush communities in the Project Area to be restored to pre-disturbance conditions.

- **Rationale:** The NPL Project could result in surface disturbance and other activity that decreases the quantity and quality of Sage-Grouse habitat, including in PHMA and wintering habitat. Decreased quantity and quality of Sage-Grouse habitat in PHMA and Winter Concentration Area represents a residual effect to a resource that is considered important, scarce, sensitive, or has a protective legal mandate that has been identified through this NEPA process as warranting appropriate additional mitigation to mitigate for long-term and temporary habitat loss. Without appropriate additional mitigation, the residual effects could inhibit achieving the BLM Wyoming Sage-Grouse Approved Resource Management Plan (BLM 2015e) objectives, and, therefore, warrant appropriate additional mitigation. In addition, as indicated in the BLM Wyoming Sage-Grouse RMP Amendments (BLM 2015e), when authorizing third-party actions that result in Sage-Grouse habitat loss and degradation in PHMA, the BLM will require and ensure mitigation that provides a net conservation gain (the actual benefit or gain above baseline conditions) to the species. As a result, appropriate additional mitigation during site-specific permitting may be warranted to achieve existing land use plan objectives

and guidance and to address remaining residual effects to an important resource (i.e., Sage-Grouse habitat).

**Residual Effect: Impacts to Areas where Sage-Grouse have been Observed during Winter but are outside Delineated Winter Concentration Areas.** Decrease in or degradation of seasonal habitats, including areas where Sage-Grouse have been observed during winter (Map 40), could result in local and regional impacts to Sage-Grouse as these areas are important to the life cycle of Sage-Grouse.

- **Rationale:** There are areas within the Project Area, but outside of delineated Winter Concentration Areas, where flocks of more than 50 Sage-Grouse have been observed during the winter (Map 40). Sage-Grouse could experience adverse residual impacts in these areas, which are not subject to the same timing limitations and other protection measures as the delineated Winter Concentration Areas. The potential impacts to areas where Sage-Grouse have been observed during the winter but are outside of delineated Winter Concentration Areas, and not afforded the same protection measures as delineated Winter Concentration Areas, represents a residual effect to a resource that is considered important, scarce, sensitive, or has a protective legal mandate that has been identified through this NEPA process as warranting appropriate additional mitigation.

**Residual Effect: Sage-Grouse Impacts Resulting from RGFs in PHMA and Winter Concentration Areas.** Due to the acreage of Sage-Grouse PHMA and Winter Concentration Areas in the Project Area, RGFs may need to be located within PHMA and Winter Concentration Areas to effectively service well pads located in these areas. Locating RGFs within Sage-Grouse PHMA and Winter Concentration Areas could result in adverse impacts to Sage-Grouse resulting from noise impacts, direct mortality, surface disturbance, and other increased human and project-related activity associated with these facilities.

- **Rationale:** As indicated in the BLM Wyoming Sage-Grouse RMP Amendments (BLM 2015e), when authorizing third-party actions that result in Sage-Grouse habitat loss and degradation in PHMA, the BLM will require and ensure mitigation that provides a net conservation gain (the actual benefit or gain above baseline conditions) to the species. Additionally, the BLM Wyoming Sage-Grouse RMP Amendments indicate that liquid gathering facilities should be placed outside priority areas. The nature and extent of residual effects associated with long-term loss of habitat and disruption to Sage-Grouse behavior caused by increased human and project-related activity associated with RGFs were identified through the NEPA process as warranting appropriate additional mitigation. Without appropriate additional mitigation, the residual effects would inhibit achieving BLM Wyoming Sage-Grouse ARMPA objectives, and, therefore, warrant additional mitigation.

This section describes the landscape-level objectives, desired outcomes, and standards for appropriate additional mitigation for the residual impacts to Sage-Grouse that warrant additional mitigation, as identified above. This section also identifies potential additional mitigation options that could be considered and applied during site-specific permitting to meet the identified landscape-scale objectives, desired outcomes, and standards for mitigation and the process for considering and applying appropriate additional mitigation during site-specific permitting. This section also includes a description of monitoring and reporting for additional mitigation and the importance of additional mitigation being durable for the duration of the impacts warranting additional mitigation.

## **Consultation and Coordination**

Chapter 5 (*Consultation and Coordination*) describes agencies, organizations, and individuals that were contacted or consulted during preparation of the NPL Project EIS. This chapter also summarizes the National Historic Preservation Act Section 106 and Endangered Species Act Section 7 consultation processes, public participation, scoping process, newsletters, summary of public and agency comments, and a list of preparers.

The BLM signed memoranda of understanding (MOUs) with nine agencies that worked as cooperating agencies during the preparation of the NPL Project EIS. The nine cooperating agencies included:

- U.S. Environmental Protection Agency
- Lincoln County
- Lincoln County Conservation District
- State of Wyoming (including all appropriate state agencies)
- Sublette County
- Sublette County Conservation District
- Sweetwater County
- Sweetwater County Conservation District
- Town of Pinedale

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