

## **CHAPTER 5 — ADDITIONAL POTENTIAL MITIGATION, MONITORING MEASURES AND COMPENSATORY MITIGATION IDEAS**

This chapter provides a summary of mitigation and monitoring actions that could be applied to the project to further minimize adverse impacts or verify the presence, extent or absence of anticipated impacts. This list itemizes mitigation, monitoring, and compensatory mitigation (CM) that have been identified by the public and/or Interdisciplinary Team (IDT) members and that are not already included in the BLM Preferred Alternative (see Section 2.14) or the Operator-committed practices detailed in Appendix B. Each listed measure is briefly summarized and includes an identification of how application of the measure may influence project effects. CM ideas include estimated costs where available, and identification of which resource(s) might benefit from that type of CM project.

Any of the listed actions may be required or recommended under any alternative if this project is approved. Decisions regarding the inclusion or exclusion of these actions will be made in the ROD for this project.

### **5.1 ADDITIONAL MITIGATION OPPORTUNITIES**

The JIWG could consider the following measures for application to the project as part of its annual recommendations to the BLM. Following JIWG recommendation, BLM could require certain of these actions, or make appropriate recommendations to affected Governments, Agencies, and/or applicable Operators. Operators could commit to the application of these measures with or without JIWG recommendation.

#### **5.1.1 Air Quality**

The following mitigation actions could reduce overall project emissions, which in turn could protect other resources such as visibility, acid deposition, vegetation, wildlife and other resources potentially affected by fugitive dust and emissions. These actions include:

- a HAP assessment at five locations in the JIDPA to assess ambient air concentrations to address public concerns;
- work with WDEQ/AQD to evaluate the use of alternate technologies (e.g., condensers on dehydrators, carbon filters on condensate tanks, remote telemetry monitoring) for well pad production facilities (dehydrators, separators, heaters) to reduce emissions from these features and traffic;
- use low-pressure gas gathering pipelines to reduce compression needs, recover flash gas lost during processing, and eliminate VOC and HAP emissions when the gas is introduced to the sales gas distribution system;

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- use Tier II-compliant diesel engines and/or other low emission drill rig engines, including alternatively powered drill rig engines (e.g., natural gas, hybrid non-diesel), on all drill rigs operating in the JIDPA when they become available;
  - work with the WDEQ/AQD developing and financing appropriate identification, monitoring, and emissions control procedures for HAPs and other emissions from water treatment/disposal facilities; and
  - use alternative energy sources (e.g., solar, wind, hydrogen) to power proposed internal combustion engines.

### **5.1.2 Topography**

The following action could protect important or unique topographic features in the JIDPA, which in turn could reduce soil erosion and protect the wildlife habitats provided by these features:

- no disturbance at rock outcrops in the JIDPA.

### **5.1.3 Paleontology**

The following action could protect important or unique paleontological features in the JIDPA by identifying their location and subsequently restricting project activities that could disturb them:

- an active program of inventory and evaluation of sediments known or suspected to contain paleontological materials and an assessment of cumulative impacts.

### **5.1.4 Soil Resources**

The following actions could protect soils by reducing erosion, compaction, loss through mixing with unsuitable plant growth material, and the time necessary for disturbance to be reclaimed. By reducing soil erosion, these actions could also protect surface water quality and promote revegetation, which in turn could promote the provision of forage for livestock and wildlife. These actions include:

- site-specific predisturbance landscape descriptions, including soils data, plant species composition and cover data, and proposed reclamation seed mixes with application rates;
- analyze soils prior to disturbance to determine appropriate reclamation seed mixtures and potential soil amendment needs; and
- utilization of fertilizers or other soil amendments at reclamation sites to facilitate site re-vegetation.

### **5.1.5 Surface Water Resources**

The following actions could protect surface water resources and could protect ground water quality in areas where surface water percolates below the ground surface:

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- utilize catchment basins, sediment retention ponds, and/or spreader dikes within or external to the JIDPA to capture potentially increased flows due to runoff from disturbed areas to prevent channel morphology damage;
  - monitor channel condition in the JIDPA with photo points and/or other appropriate methods in coordination with BLM;
  - no additional linear crossings (road and/or pipeline crossings/crossing corridors) of Sand Draw and/or other ephemeral drainages, unless it can be proven that such activity would reduce the erosive potential of the JIDPA and could be accomplished with no disturbance to the drainages;
  - hold storm water and snowmelt water in the JIDPA for as long as possible to allow for infiltration, reduce runoff energy and associated sediment loads, using geofabrics, jute netting, spreader dikes, retention ponds, additional armoring of existing water courses, or other techniques;
  - develop and implement an adaptive surface water management plan for the entire JIDPA which could include the NPDES process and consider runoff on a cumulative watershed basis;
  - pipeline crossings of all drainage channels could be fitted with shutoff valves or other systems to minimize accidental discharge and facilitate channel protection from contamination in the event of a pipeline break;
  - maximize recycling of waters utilized and produced for this project and increase capacities to both treat and re-use clean produced water within the field;
  - consider produced water treatment and/or disposal facilities (e.g., evaporation ponds) on federal surface in the JIDPA; and
  - file all NPDES permits and associated water quality data with the BLM and consult with WDEQ, WGF, BLM and livestock permittees before any water release.

### **5.1.6 Vegetation, Including TEP&C and BWS Plant Species**

The following actions could protect vegetation, including TEP&C and BWS plant species and protect soils, water quality, and wildlife habitat and livestock forage:

- scalping and post-construction ripping rather than removal and re-spreading of topsoil for all new pipelines;
  - establish vegetative plots to scientifically evaluate reclamation success, to develop appropriate procedures for timely sagebrush reestablishment, and/or to further identify the most desirable reclamation species; and
  - in coordination with the BLM, Natural Resources Conservation Service and Sublette County Conservation District, Operators could utilize irrigation at reclamation sites to improve germination and vegetation establishment.
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### 5.1.7 Wildlife, Including TEP&C and BWS Animal Species

The following actions could protect wildlife, including TEP&C and BWS animal species and soils, vegetation, and water quality resources:

- utilization of low-profile tanks within line-of-sight, up to a maximum of 0.5 mile, of greater sage-grouse leks;
- develop water sources within the JIDPA that are outside of areas with a high level of development for area wildlife and/or convert existing project-developed water wells for wildlife use when they are no longer required;
- avoid all raptor nest territories (rather than just active nests) during the nesting season;
- expand annual wildlife monitoring in the JIDPA and Wildlife Study Area to include new wildlife/habitat study opportunities identified in consultation with the BLM, WGFD and/or USFWS;
- modify wildlife protection measures (e.g., altered buffer area sizes, seasonal restriction dates) based on the results of annual monitoring and/or other regional wildlife studies;
- develop habitat enhancement projects on the JIDPA to accommodate displaced wildlife or altered migration routes; and
- inventory the Big Piney white-tailed prairie dog complex for black-footed ferrets and pursue a block clearance of the complex.

### 5.1.8 Cultural Resources

The following actions could protect cultural resources:

- develop and implement a research design, discovery plan, and/or cultural resource management plan for the combined areas of the Pinedale Anticline Project Area and JIDPA, and consult with SHPO pursuant to the effect of these plans on affected cultural resources;
- implement larger cultural resource survey areas for site-specific development actions (areas of potential effect); and
- intensify data collection efforts at affected high-value archaeological sites in exchange for disturbance of sites with less unique values.

### 5.1.9 Land Use/Livestock Grazing

The following actions could protect livestock from hazards associated with development:

- Operators could commit to work with BLM and affected livestock permittees to mitigate the loss of AUMs in the JIDPA through provision of range improvement projects to modify grazing distribution patterns (e.g., water developments, vegetation treatments,
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irrigation, fencing, use of herders, actions that improve carrying capacity) within the project-affected allotments;

- Operators could commit to reduce fugitive dust on all proposed roads to decrease the potential for dust pneumonia in cattle; and
- Operators could commit to converting project-developed water wells for livestock use when they are no longer required for the project.

### **5.1.10 Land Use/Recreation**

The following actions could minimize adverse project effects to JIDPA recreation by providing a new tourism opportunity:

- provide one or more quality interpretive sites with public access and/or publications with public distributions to provide the general public and interested parties educational information regarding JIDPA developments and management actions for other area-specific natural resource values.

### **5.1.11 Land Use/Transportation**

The following actions could reduce impacts to roads, the transportation network, the traveling public, air quality, soils, vegetation, wildlife, livestock grazing, and recreation:

- prepare road development and transportation management plans;
- utilize car pools and/or bus crews from communities of origin to the field to minimize commuting traffic;
- utilize existing roads in the JIDPA as collector and/or resource roads to the maximum extent possible to avoid new surface disturbance; and
- Operators could jointly develop and submit for BLM approval road maintenance and use agreements designating road development, maintenance, and use requirements by each Operator. These agreements could identify responsibilities for necessary preventative and corrective road maintenance throughout the LOP. Maintenance responsibilities could include, but not be limited to, blading, gravelling or aggregate-surfacing, cleaning ditches and drainage facilities, dust abatement, noxious weed control, culvert maintenance and repair, or other requirements.

### **5.1.12 Visual Resource**

Additional measures identified for vegetation and wildlife habitat (reclamation actions) and transportation (reduced traffic volumes) could also benefit visual resources. The following measure could also reduce project impacts to the visual resource:

- funding a hosted worker (visual resource management specialist) to be assigned to the BLM PFO.
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### 5.1.13 Health and Safety/Hazardous Materials

The following measures could protect public and worker health and safety and improve BLM's inspection and enforcement capability:

- provide the BLM copies of field- or lease-specific SWPPPs, SPCCPs, Spill Response Plans, and Emergency Response Plans;
- fill pipelines with clay or cement slurry at abandonment
- install highly visible signage on JIDPA access roads to
  - notify the public of the presence of potentially hazardous features in the area,
  - advise the public to stay on developed roads and avoid well pads and other facility sites, and/or
  - identify areas of no overnight camping, no discharge of firearms, no off-leash pets, and/or no off-road travel; and
- install and lock all gates at all non-major transportation routes in the JIDPA (e.g., well and facility site access roads) to control unauthorized access.

### 5.1.14 Other Actions

The following actions or recommendations could enhance various resource protections, facilitate field management, or assist other entities with management decisions. These actions include:

- implement Operator-committed practices under any approved alternative when not already committed to (see Appendix B, Exhibit B-1) or required by BLM;
  - file valid copies of access and/or surface use agreements between Operators and the private surface owner with APDs and/or ROW grants with the BLM for all future development proposals on private surface with BLM mineral estate. This action could be beneficial for area transportation planning (optimization of road location and design, road maintenance planning) for single roads that cross both public and private surface by providing an opportunity for the BLM to coordinate agreement specifications;
  - Operators could acquire the 640 acres of private land surface in the JIDPA. This action could reduce potential conflicts between Operators and the private landowner, and facilitate comprehensive management of the entire area as a contiguous block rather than a patchwork of separately owned sections with varying management protocols;
  - utilize new drilling and development technologies (e.g., laser drilling, natural gas powered drill rig engines, micro-hole drilling, mat drilling) as they become available and feasible. This could decrease a variety of impacts and assist Operators in developing research or pilot projects to test new development technologies;
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- utilize unknown technologies or technological innovations as they become available and feasible to minimize pad/road/pipeline/ancillary facility footprints and/or other adverse impacts;
  - increase bond amounts for JIDPA developments. Such action could ensure that sufficient funds are available to reclaim disturbed areas in the event Operators inadequately implement reclamation;
  - Operator surveyors could submit electronic data for wells, roads, pipelines, and other project infrastructures in a format suitable to the BLM. Provision of electronic data would allow for consistency among project data across Operators and would facilitate BLM database management. This action could benefit all area resources potentially affected by specific project development features (e.g., wildlife, habitats);
  - Operators could provide hosted workers to the BLM as needed throughout the project development phase or LOP. If applied, this measure could facilitate efficient and timely BLM permitting;
  - investigate the feasibility of providing gas from the JIDPA to area gas users (e.g., local residents and businesses). If applied this measure could provide area residents with reduced natural gas costs, potentially off-setting regional natural gas cost increases to local consumers;
  - utilize smaller ROWs to disturb less surface area during pipeline construction, and initially install larger diameter pipelines to minimize pipeline disturbance corridor widths. If applied, this measure could reduce all impacts associated with linear surface disturbances; and
  - develop a wildlife compensation fund to be administered by the State of Wyoming.

## 5.2 COMPENSATORY (OFF-SITE) MITIGATION IDEAS

The following list is not intended to be exhaustive. It is simply a list of the types of CM activities that could be undertaken to mitigate for impacts within the JIDPA that cannot be fully mitigated on-site, to substitute similar resources for those not able to be mitigated on-site in the JIDPA, or to provide tangible benefits similar to those that would have been provided with successful on-site mitigation in the JIDPA. The CM guidelines provided in Section 4.8 would apply to these or any other projects proposed for CM.

*Assist with funding for a WDEQ mobile emissions inspector for the JIDPA for 5 years, or financially assist WDEQ and USFS with on-going air quality monitoring in the Upper Green River area; consultation with the USFS and WDEQ/AQD to develop and implement a consistent funding mechanism to continue existing on- and off-site air quality monitoring actions at Class I airsheds and sensitive lakes. Monitoring at local communities and/or at other potentially affected sites could also be implemented.*

- Impacted resource potentially benefited: Air quality
  - Cost estimate: \$15,000 to \$100,000 per year
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*Install a headcut stabilization structure in the Alkali Creek drainage outside the JIDPA*

- Impacted resources potentially benefited: Soils, topography, surface water
- Cost estimate: \$10,000 to \$15,000

*Purchase a conservation easement on an irrigated hay meadow adjacent to existing greater sage-grouse habitat that is as close to the JIDPA as possible, that is not encumbered by fluid mineral leases, and restore that meadow to sagebrush vegetation similar to the adjacent sagebrush community*

- Impacted resources potentially benefited: Soils, vegetation, greater sage-grouse and other sagebrush-obligate species
- Cost estimate: Conservation easements could vary from a few thousand to several million dollars, depending on size and location; restoration costs, likely less than \$500,000

*Purchase right-of-way and install water improvement on an area near but outside the JIDPA where forage is underutilized for lack of water*

- Impacted resources potentially benefited: Wildlife including TEP&C and BWS, soils, surface water, vegetation, livestock grazing
- Cost estimate: Rights-of-way could vary from several hundred to several thousand dollars, depending on size and location; water improvement costs, likely less than \$100,000

*Purchase a large block of sagebrush ecosystem land as close as possible to the JIDPA, that is unencumbered by fluid mineral leases and is adjacent to existing greater sage-grouse habitat, and enhance sagebrush habitat function on that land for LOP at a ratio of 3:1, or three acres enhanced for every acre impacted in the JIDPA*

- Impacted resources potentially benefited: Wildlife including TEP&C and BWS, vegetation, soils
- Cost estimate: Land prices vary from several thousand to tens of millions of dollars, depending on existing use, location, and parcel size; enhancement activity costs, likely less than \$500,000

*Purchase development rights on grasslands in the area that are unencumbered by fluid mineral leases, and enhance forage production*

- Impacted resources potentially benefited: Wildlife including TEP&C and BWS, vegetation, soils, visual, recreation, livestock grazing
- Cost estimate: Development rights costs vary considerably with location and parcel size, and could vary from several thousand to several million dollars; forage enhancement costs, likely less than \$500,000

*Assist local government with funding of public service projects such as city sewage treatment facility upgrade, mosquito abatement, or West Nile virus inoculation programs*

- Impacted resource potentially benefited: Socioeconomic
- Cost estimate: Several thousand to several million dollars



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*Purchase conservation easement and establish and maintain 3 ferruginous hawk or bald eagle or burrowing owl nesting sites as close as possible to the JIDPA, and facilitate continued occupation of those nests for LOP*

- Impacted resource potentially benefited: Wildlife
- Cost estimate: Cost of conservation easement + up to \$10,000

*Work with impacted communities to develop and fund “portable” infrastructure enhancements (infrastructure provided by Operators during “boom” peaks, removed by Operators during “bust” times)*

- Impacted resource potentially benefited: Socioeconomic
- Cost estimate: Several thousand to several million dollars

*Work with WyDOT and/or Sublette County Road and Bridge to install appropriate road-side signs outside the JIDPA that indicate potential hazards (e.g., school bus stops, high-traffic volume turnouts, trucks entering roadway)*

- Impacted resource potentially benefited: Socioeconomic
- Cost estimate: Likely less than \$10,000

*Develop wildlife habitat improvements designed to increase huntable/viewable species populations*

- Impacted resource potentially benefited: Socioeconomic, recreation, wildlife
  - Cost estimate: Several thousand to several million dollars
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