



U.S. Department of the Interior
Bureau of Land Management

2025 Battle Mountain District Oil and Gas Competitive Lease Sale

Environmental Assessment

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Acronyms & Definitions

Table 1. Acronym and Definition

ACEC	Area of Critical Environmental Concern
AFY	acre-feet (AF) or acre-feet per year
APD	Application for Permit to Drill
AQI	Air Quality Index
AQRV	Air Quality Related Values
AR	Assessment Report
ARMPA	Approved Resource Management Plan Amendment
AUM	Animal Unit Month
BAPC	Bureau of Air Pollution Control
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BMD	Battle Mountain District
BMPs	Best Management Practices
CAA	Clean Air Act
CAP	Criteria Air Pollutants
CESA	Cumulative Effects Study Area
CFR	Code of Federal Regulations
COAs	Conditions of Approval
CSU	Controlled Surface Use
DOE	Department of Energy
DOI	United States Department of the Interior
EA	Environmental Assessment
EIA	Energy Information Administration
EIS	Environmental Impact Statement
EJ	Environmental Justice
EO	Executive Order
EOI	Expression of Interest
ESA	Endangered Species Act
EPA	Environmental Protection Agency
EUR	Estimated Ultimate Recovery
FLPMA	Federal Land Policy and Management Act of 1976
FONSI	Finding of No Significant Impact

FOOGLRA	Federal Onshore Oil and Gas Leasing Reform Act
FR	Federal Register
FRP	Facility Response Plan
GBNP	Great Basin National Park
GHG	Greenhouse gas
GHGRP	Greenhouse Gas Reporting Program
GHMA	General Habitat Management Area
GIS	Geographic Information System
GRSG	Greater Sage-Grouse
GWP	Global Warming Potential
HAP	Hazardous Air Pollutants
HF	Hydraulic Fracturing
HMA	Herd Management Area
ID Team	interdisciplinary team
IM	Instruction Memorandum
IPCC	International Panel Climate Change
LN	Lease Notice
LUP	Land Use Plan
MBTA	Migratory Bird Treaty Act
MD	Management Decision
MLA	Mineral Leasing Act
MLFO	Mount Lewis Field Office
MOU	Memorandum of Understanding
MR	Mineral Resources
MT	Megatonne
NAAQS	National Ambient Air Quality Standards
NAC	Nevada Administrative Code
NCLS	Notice of Competitive Lease Sale
NDA	Nevada Department of Agriculture
NDEP	Nevada Division of Environmental Protection
NDOM	Nevada Division of Minerals
NDOW	Nevada Department of Wildlife
NDWR	Nevada Division of Water Resources
NDWQ	Nevada Division of Water Quality

NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NNHP	Nevada Natural Heritage Program
NOAA	National Oceanic and Atmospheric Administration
NVSO	Nevada State Office
NSO	No Surface Occupancy
OG	Oil and gas
OHMA	Other Habitat Management Area
ONRR	Office of Natural Resources Revenue
PHMA	Priority Habitat Management Area
PL	Public Law
PLO	Public Land Order
PRMP	Proposed Resource Management Plan
RFD	Reasonably Foreseeable Development
RFFD	Reasonably Foreseeable Future Development
RMP	Resource Management Plan
ROD	Record of Decision
ROW	Right-of-Way
SETT	Sagebrush Ecosystem Technical Team
SFA	Sagebrush Focal Area
SHPO	Nevada State Historical Preservation Office
SOP	Standard Operating Procedures
SRMA	Special Recreation Management Area
SSS	Special Status Species
TFO	Tonopah Field Office
TL	Timing Limitation
U.S.	United States
USC	United States Constitution
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGCRP	United States Climate Research Panel
USGS	United States Geological Survey
VOC	Volatile Organic Compound

VRI	Visual Resource Inventory
VRM	Visual Resource Management
WMA	Wildlife Management Area
WO	Washington Office
WSA	Wilderness Study Area

Chapter 1. Introduction

1.1 Background

It is the policy of the Bureau of Land Management (BLM), as mandated by various laws including the Mineral Leasing Act (MLA) of 1920 and the Federal Land Policy and Management Act (FLPMA) of 1976 (FLPMA), to make mineral resources available and to encourage their development to meet national, regional, and local needs. The MLA establishes that deposits of oil and gas owned by the United States are subject to disposition in the form and manner provided by the MLA under the rules and regulations prescribed by the Secretary of the Interior, where consistent with FLPMA and other applicable laws, regulations, and policies. Additionally, the Federal Onshore Oil and Gas Leasing Reform Act of 1987 (FOOGLRA) states that lease sales shall be held for each State where eligible lands are available at least quarterly and more frequently if the Secretary of the Interior determines such sales are necessary. Eligible lands are those that are open for leasing, and which the BLM has received Expressions of Interest (EOIs) nominating lands to be offered for lease.

During the land use planning process required by the FLPMA¹, the BLM analyzes several alternatives before deciding which public lands and minerals are open for leasing and under what terms and conditions. In accordance with the Land Use Plan (LUP), lands can be deemed open to leasing under standard terms and conditions, closed to leasing, or open under special operating constraints—including No Surface Occupancy (NSO)—identified as lease stipulations at the lease stage. Lease stipulations (43 Code of Federal Regulations [CFR] 3101.13) are used to mitigate potential impacts to resources. Any surface management of non-BLM administered land overlaying federal minerals is determined by the BLM in consultation with the appropriate surface management agency or the private surface owner.

The BLM implements the LUP by processing public EOIs on a quarterly basis. The Nevada State Office (NVSO) reviews the EOIs and determines whether or not the existing NEPA analyses prepared for the LUPs provide basis for leasing oil and gas resources within these parcels, or if additional analysis is needed before making a leasing decision. Once the NVSO reviews the nominations, removes lands not legally available for leasing, and compiles the remaining lands, NVSO sends a preliminary parcel list to the appropriate District Office where the parcels are located. Whereas the decision to open lands to leasing was not an irretrievable commitment of resources, implementing the decision by offering parcels may be. As such, when the BLM incrementally implements the RMP decision by proposing to lease specific parcels, its resource specialists review the area potentially affected to determine if there is new information or circumstances, and if there is, if it would substantially change the analysis in the planning documents (keeping in consideration the lease stipulations), and effects are similar both quantitatively and qualitatively to those identified in the programmatic documents, again, keeping in consideration the lease stipulations.

District and field office staff review the legal descriptions of the parcels to confirm they are in areas open to leasing under the relevant LUPs, ensures appropriate stipulations have been applied and identify any special resource conditions of which potential bidders should be made aware, resulting in the attachment of lease notices (LN) (43 CFR 3101.13).

Once the Field Office completes the interdisciplinary parcel review (ID Team) the BLM determines if preparation of an EA is necessary for considering the public nominated parcels for the lease sale. If so,

¹ The land use planning process can result in several types of Land Use Plans (LUPs) or the amendment of existing LUPs. The most common LUP is a Resource Management Plan (RMP), which guides the management of all resources within the boundaries of a BLM Field Office. Older LUPs may be limited to managing part of a Field Office, or multiple Field Offices.

this EA and an unsigned FONSI are made available to the public, along with the list of available parcels and stipulations and notices, for a 30-day public comment period on the BLM's NEPA Register (also known as ePlanning).² Additional information regarding the BLM's leasing process is also made available for public review and reference. When the public comment period ends, the BLM analyzes and incorporates the comments, where appropriate, into the EA. The final parcel list with stipulations and notices is made available to the public through a Notice of Competitive Lease Sale (NCLS), which starts a 30-day protest period, and includes the revised EA and unsigned FONSI. If any changes to the parcels, lease notices, or stipulations result from the protests, an erratum to the NCLS would be posted to the BLM website and on NEPA Register to notify the public of the change, prior to the lease sale. The parcels would be available for sale at an online auction held by the BLM, tentatively scheduled for March 18th, 2025.

Once the lease has been issued, the lessee has the right to use as much of the leased land as necessary to explore for, drill for, extract, remove, and dispose of oil and gas deposits located under the leased lands, subject to non-discretionary statutes, the standard lease terms, and stipulations. Even if no restrictions are attached to the lease, the operations must be conducted in a manner that avoids unnecessary or undue degradation of the environment and minimizes adverse effects on the land, air, water, cultural, biological, and visual elements of the environment, as well as other land uses or users. An issued lease may be held for ten years, after which the lease expires unless oil or gas is produced in paying quantities (43 CFR 3107.21)³. A producing lease can be held indefinitely by economic production.

The Mineral Leasing Act (MLA) of 1920, as amended by the Federal Coal Leasing Amendments Act of 1976, affect an entity's qualifications to obtain an oil and gas lease. Section 2(a)(2)(A) of the MLA, 30 U.S.C. 201(a)(2)(A), requires that any entity that holds and has held a Federal Coal Lease for 10 years beginning on or after August 4, 1976, and that is not producing coal in commercial quantities from each such lease cannot qualify for the issuance of any other lease granted under the MLA. 43 CFR 3472 explains coal lessee compliance with Section 2(a)(2)(A). Lease notice, HQ-MLA-1, is added to all parcels notifying lessees of this situation.

.2 Project Location

The Bureau of Land Management (BLM) Battle Mountain District (BMD) office encompasses about 13.5 million acres, of which approximately 10.4 million acres are public lands managed by the BLM. The March 2025 preliminary parcel list (Appendix A: Parcel List) contains 12 parcels covering 23,202.36 acres in Mount Lewis and Tonopah Field Offices (Appendix D: Maps). The lease parcels are located in Big Smoky Valley, Fish Creek Valley, and Railroad Valley.

1.3 Purpose and Need for Action

The purpose of this action is for the BMD to respond to Expressions of Interest. The need for the Proposed Action is established by the BLM's mandates under the Acts discussed in Section 1.1, as well as the Mining and Minerals Policy Act of 1970, as amended.

1.4 Decision to be Made

Based on the EA, BLM management will decide which parcels to make available for leasing and which stipulations and lease notices to attach. The parcels included in the State Director's decision are made

² The NEPA Register is a BLM environmental information internet site and can be accessed online at: <https://eplanning.blm.gov/eplanning-ui/home>.

³ Unless the lease is within an Operating Unit and the Unit is held by production of wells on other leases within the Unit.

available to the public through the NCLS, which specifies stipulations applicable to each parcel. (Here and throughout this EA the term “parcels” refers to “parcels or parts of parcels,” as stipulations are applied to the smallest appropriate part of a parcel, down to 40-acre quarter-quarter section or lot, or smaller if specified in the applicable RMP.)

1.5 Land Use Plan Conformance

Under FLPMA, the BLM must manage for multiple uses of public lands in a combination that will best meet the present and future needs of the public and their various resources based on an approved land use plan or resource management plan (RMP). For split-estate lands where the mineral estate is an interest owned by the United States, the BLM has no authority over use of the surface by the surface owner; however, the BLM is required to declare in the RMP how the federal mineral estate will be managed, including identification of all appropriate lease stipulations (43 CFR 3101.13 and 43 CFR 1601.0-7(b); BLM Manual 1601.09 and Handbook H-1624-1).

The Proposed Action is in conformance with the Shoshone-Eureka RMP and Tonopah RMP, and the associated Records of Decision, and all subsequent applicable amendments. The RMPs address land use goals and objectives, allowable uses, and management actions for the field office.

Shoshone-Eureka RMP (Mt. Lewis Field Office), approved 1986

The Proposed Action is in conformance with the Shoshone-Eureka RMP Part II, Section E, Management Actions Not Expressly Addressed by the Resource Management Plan, which includes Minerals Objectives and Management Decisions brought forward unaltered from the Management Framework Plan (Record of Decision p. 29). Minerals Objectives 1, 2, and 3 led to Management Decisions 1 through 5 for leasable minerals (geothermal). The objectives are as follows:

- Objective 1: Make available and encourage development of mineral resources to meet national, regional and local needs consistent with national objectives for an adequate supply of minerals.
- Objective 2: Assure that mineral exploration, development and extraction are carried out in such a way as to minimize environmental and other resource damage and to provide, where legally possible, for the rehabilitation of lands.
- Objective 3: Develop detailed mineral resource data in areas where different resources conflict so that informed decisions may be made that result in optimum use of the lands.

Management Decision #4 states, “All areas designated by the BLM as prospectively valuable for oil and gas will be open to leasing except as modified by other resources.” The RMP has been reviewed for modifications by other resources; none were identified for the nominated parcels.

It has been determined that the nominated lease parcels are a subset of the of 4.4 million acres managed by the Mount Lewis Field Office that is open to fluid minerals leasing subject to standard terms and conditions. The RMP and parcel list have been reviewed for applicability of RMP decisions imposing restrictions on fluid minerals activities.

Tonopah RMP (Tonopah Field Office), approved 1997

Fluid Minerals Objective: “To provide opportunity for exploration and development of fluid minerals such as oil, gas, and geothermal resources, using appropriate stipulations to allow for the preservation and enhancement of fragile and unique resources” (p.22).

It has been determined that the nominated lease parcels are a subset of “[The] total of 5,360,477 acres (88% of the Tonopah Field Office area) [that] is open to fluid minerals leasing subject to standard terms and conditions” (RMP p.22). The RMP and parcel list have been reviewed for applicability of RMP decisions imposing restrictions on fluid minerals activities.

2015 Nevada and Northeastern California Greater Sage-Grouse Approved Resource Management Plan Amendment (ARMPA) (BLM, 2015), which amends several BLM land use plans including the Tonopah and Shoshone-Eureka RMPs. The proposed parcels include some areas mapped as General Habitat Management Area (GHMA), or Other Habitat Management Area (OHMA).

GRSG Plan Amendment Section 2.2, Management Decisions (MD) for Mineral Resources (MR), Unleased Fluid Minerals include the following applicable MD:

- MD MR 1: Review Objective SSS 4 and apply MDs SSS 1 through SSS 4 when reviewing and analyzing projects and activities proposed in GRSG habitat. [These would be applied at the time of additional project-specific analysis.]
- MD MR 3: In PHMAs outside of SFA, no waivers or modifications to an oil and gas lease no-surface occupancy stipulation will be granted.
- MD MR 5: In GHMAs, manage oil and gas and geothermal fluid minerals with moderate constraints, timing limitations, and controlled surface use stipulations.
- MD SSS 20: Once a hard trigger has been reached, all responses in Table J-1 and Table J-2 in Appendix J will be implemented. This includes where soft triggers have been reached for both population and habitat.

GRSG Plan Amendment Appendix G, Fluid Mineral Stipulations, Waivers, Modifications, and Exceptions, specifies the stipulations to apply to each habitat type. The stipulations have been applied to each part of a parcel with GRSG habitat, down to the 40-acre quarter-quarter of a section, using the highest applicable level of protection (e.g. if a quarter-quarter section includes PHMA and GHMA, stipulations for PHMA are applied), See Appendix B: Lease Notices and Stipulations).

2022 Plan Maintenance to the 2015 Nevada and Northeastern California Greater Sage-Grouse Approved Resource Management Plan Amendment (ARMPA)

"On May 12, 2022, a Plan Maintenance Action to the Nevada and Northeastern California Sub-Region Greater Sage-Grouse Record of Decision and Approved Resource Management Plan Amendment (September 15, 2015) was signed. This Maintenance Action consisted of two parts, updating the Greater Sage-Grouse Habitat Management Area (HMA) Map with the latest data from USGS and the State of Nevada, and updating the Habitat Objectives for GRSG in line with the latest science.

The overall goal of the 2015 ARMPA is to conserve, enhance, and restore the sagebrush ecosystem upon which Greater Sage-Grouse populations depend, in an effort to maintain and/or increase their abundance and distribution in cooperation with other conservation partners. As the BLM implements the 2015 ARMPA, it sometimes becomes necessary to make minor changes, refinements, or clarifications of the plan. Potential minor changes, refinements, or clarifications in the plan may take the form of maintenance actions.

The updated 2021 HMA map that this Maintenance Action adopted includes additional areas in California that were not included in the 2016 map and removes some areas that no longer meet the definition of HMAs because they no longer support breeding GRSG, nor connect populations within HMAs. In addition, it adopts boundary modifications made by the State of Nevada to the 2016 map."

1.6 Relationship to Statutes, Regulations and Policy

The Proposed Action and alternatives are in conformance with the NEPA of 1969 (P.L. 91-190 as amended; 42 U.S.C. §4321 et seq.); the MLA of 1920 as amended and supplemented (30 U.S.C. 181 et seq.); the FOOGLRA of 1987, with regulatory authority under 43 CFR Part 3100, Onshore Oil and Gas

Operations (43 CFR Part 3160); 43 CFR 3170; and Title V of the FLPMA of 1976, Rights-of-Way (ROW), with regulatory authority under 43 CFR Part 2800, ROW.

Purchasers of oil and gas leases are required to abide by all applicable federal, state, and local laws and regulations. This includes obtaining all required permits if they develop the lease. All activities will be subject to regulations including, but not limited to, the following:

- *Bald and Golden Eagle Protection Act (BGEPA)*
- *BLM and Nevada Department of Wildlife (NDOW)*
- *BLM Special Status Species (SSS)*
- *Clean Air Act (CAA)*
- *Clean Water Act (CWA)*
- *Endangered Species Act (ESA)*
- *Energy Policy Act*
- *Executive Order 11988 Floodplains*
- *Executive Order 13690 Implementation for Floodplains*
- *Executive Order 11990 – Protection of wetlands*
- *Executive Order 12898 Environmental Justice*
- *Executive Order 13212 Expedite energy-related projects*
- *Executive Order 14008*
- *Executive Order 14057 Procure 100 percent carbon pollution-free electricity by 2030*
- *Federal Land Policy and Management Act of 1976,*
- *Instruction Memo 2023-008 Impacts of the Inflation Reduction Act of 2022 (Pub. L. No. 117-169) to the Oil and Natural Gas*
- *Instruction Memo 2023-010 Oil and Gas Leasing – Land Use Planning and Lease Parcel Reviews:*
- *Mineral Leasing Act of 1920*
- *National Historic Preservation Act (NHPA) Section 106*
- *Safe Drinking Water Act*
- *Secretarial Order 3289*
- *Secretarial Order 3347*
- *Secretarial Order 3356*
- *Secretarial Order 3362*
- *Migratory Bird Treaty Act (MBTA) of 1918*
- *Wild Free-Roaming Horse and Burro Act of 1971 (WFRHBA)*

More information regarding these regulations is found in Appendix I.

1.6.1 Recent Court Decisions

The BLM is aware of the November 12, 2024 decision in Marin Audubon Society v. Federal Aviation Administration, No. 23-1067 (D.C. Cir. Nov. 12, 2024). To the extent that a court may conclude that the Council on Environmental Quality (CEQ) regulations implementing NEPA are not judicially enforceable or binding on this agency action, the BLM has nonetheless elected to follow those regulations at 40 C.F.R. Parts 1500–1508, in addition to the DOI’s procedures/regulations implementing NEPA at 43 CFR Part 46, to meet the agency’s obligations under NEPA, 42 U.S.C. §§ 4321 et seq.

1.7 Scoping and Public Involvement

External scoping: In preparation for the lease sale, BLM released the current parcel list and map to the public for scoping comments from July 29 to August 28, 2024. Scoping comments were received from three anonymous individuals, Environmental Protection Agency (EPA), Friends of the Earth, Lander County, National Wildlife Federation, U.S. Fish and Wildlife Service (USFWS), Nevada Division of Forestry, Nevada Department of Wildlife (NDOW), and Nevada Division of Water Resources (NDWR). The scoping comments received included opposition to the lease sale, support for the lease sale, climate change concerns, general NEPA concerns, concerns about BLM management, the protection of water resources, sensitive species, NV regulatory statutes, and wildlife concerns.

Internal scoping: In preparing the preliminary EA that would be released for public comment, the BMD ID Team conducted internal scoping, identified potential resource conflicts, and proposed draft stipulations and lease notices for each parcel.

Native American Coordination: The BMD initiated coordination regarding the proposed lease parcels with the following tribes via certified letters on September 18, 2024.

- Timbisha Shoshone Tribe
- Yomba Shoshone Tribe
- Duckwater Shoshone Tribe
- Shoshone-Paiute Tribes of the Duck Valley Reservation
- Ely Shoshone Tribe
- Te-Moak Tribe of Western Shoshone
- South Fork Band of the Te-Moak Tribe of Western Shoshone
- Elko Band of the Te-Moak Tribe of Western Shoshone
- Wells Band of the Te-Moak Tribe of Western Shoshone
- Battle Mountain Band of the Te-Moak Tribe of Western Shoshone

No comments were received following the public scoping period; however, coordination with the Tribes is always ongoing. If any lease parcel is later found to contain resources protected under the NHPA, American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, Executive Order 13007, or other statutes and executive orders, BLM will not approve ground-disturbing activities that may affect such resources until completing its tribal consultation obligations; and may require modification to exploration or development proposals or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized, or mitigated.

Nevada Department of Wildlife and U.S. Fish and Wildlife Service input: Concurrently with initial internal scoping, BMD provided the proposed lease sale parcel locations to NDOW and USFWS. Both agencies were available for a coordination meeting with the Nevada State Office regarding preliminary concerns.

Public comment periods and EA revisions: BLM released this EA, with Appendices and maps to the public for comments from October 28 to November 28, 2024. Public comments were received from one individual, Environmental Protection Agency (EPA); National Wildlife Federation (NWF), Nevada Wildlife Federation (NvWF) and Trout Unlimited (TU); The Wilderness Society (TWS); and Western Energy Alliance (WEA). The comments and the BLM responses are summarized in Appendix L.

1.8 EA Revisions, Clarifications, or Errata

Two changes were made to the EA since the public comment period; Section 1.6.1 Recent Court Decisions, was added and includes an excerpt from a recent court decision. This section (1.8) was added to note the changes to the EA. In addition, Stipulation NV-B-16-D-TL -Sage-Grouse Habitat, GHMA Early Brood-Rearing was corrected to be consistent National Fluid Lease Sale System (NFLSS) database.

Chapter 2. Proposed Action and Alternatives

Oil and gas leases are issued for a 10-year period and continue for as long thereafter as oil or gas is produced in paying quantities. If a lessee fails to produce oil and gas, does not make annual rental payments, does not comply with the terms and conditions of the lease, or relinquishes the lease; ownership of the minerals revert to the federal government and the lease can be resold.

If leases are issued and lease operations are proposed in the future, BLM would conduct additional project specific NEPA analysis when an Application for Permit to Drill (APD) or other exploration, development or production project application is submitted. In addition to the stipulations and notices attached to the parcel; requirements outlined in *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development* (The Gold Book); and guidelines and Best Management Practices (US DOI and USDA, 2007) would be applied.

Stipulations and/or lease notices would be attached to each offered lease parcel. The stipulations for each alternative are shown under Appendix B, with the parcels to which each stipulation would apply.

2.1 Proposed Action Alternative

The BLM would offer for lease all 12 nominated parcels (covering approximately 23,202.36 acres) in the lease sale. The leases would include the standard lease terms and conditions for development of the surface of oil and gas leases provided in 43 CFR 3100 (BLM Form 3100-11) along with all stipulations mandated by policy (such as the Competitive Leasing Handbook, H-3120-1) and by the governing LUP.

Legal land descriptions can be found in Appendix A. In this document, all lease parcel numbers beyond this table are shortened to their last four digits for simplicity.

Lease parcels along with corresponding stipulations and lease notices used to identify resource concerns during the analysis and review are located in Appendix B. Areas offered for oil and gas leasing would be subject to measures necessary to mitigate adverse impacts, according to the categories, terms, conditions, and stipulations identified in the land use plans, as amended. Under the Proposed Action, the BLM Authorized Officer also has the authority to selectively lease and subsequently issue leases, or to defer, in the light of the analysis of potential effects presented in this EA.

BLM regulations at 43 CFR 3101.12 allow for the relocation of proposed oil and gas leasing operations up to 800 meters and prohibiting new surface disturbing operations for a period of up to 90 days in any lease year to ensure that proposed operations minimize adverse impacts to resources, uses, and users.

In addition to the stipulations provided for by the governing LUP (as amended) and BLM policies, Lease Notices have been developed for conservation measures and would be applied on specific parcels as warranted by subsequent IDT review. A BLM interdisciplinary team reviewed all the parcels and applied stipulations and lease notices designed to avoid or minimize impacts to resources.

At the leasing stage it is uncertain whether development on all leased parcels will move forward; however, for the purposes of this analysis, and in order to disclose the effects, a Reasonably Foreseeable Development (RFD) Scenario is assumed wherein all 12 nominated parcels will be developed.

2.2 No Action or No Leasing Alternative

In accordance with BLM NEPA guidelines H-1790-1, Chapter 6, this EA evaluates a No Leasing Alternative which forms a baseline for assessing and comparing the potential impacts of the Proposed Action. Under this alternative, no parcels in the Battle Mountain District would be offered for lease in March 2025. Any new oil and gas development would take place on parcels that were leased in other lease sales. Surface management would remain the same and ongoing oil and gas development would continue on surrounding federal, private, and state leases.

2.3 Reasonably Foreseeable Development (RFD) Scenario Summary- Battle Mountain District

The surface disturbance estimate used to analyze the alternatives in this EA is based on the RFD scenario in Appendix C which comes from the combined Tonopah RMP and Shoshone-Eureka RMP for the BMD. Based on historic information and anticipated activity, approximately 25 wells could be drilled and 65-100 acres of surface disturbance associated with potential oil and gas exploration and production activities could be expected to occur in the BMD over the next ten years on all leased parcels in the district. Potential oil and gas exploration and production activities associated with this RFD would most likely occur in areas of high potential, such as Railroad Valley, where the proposed parcels are located.

Types of activities that could occur are assumed to be those associated with technologies currently in use in geologically similar areas, as described in Appendix C and would be limited by the stipulations applied (see Appendix B).

Chapter 3. Affected Environment, Environmental Effects, and Cumulative Effects

3.1 Analysis Process Overview

The act of leasing parcels would not cause direct effects to resources because no surface disturbance would occur. The only effects of leasing are the creation of valid existing rights and impacts related to revenue generated by the lease sale receipts. However, if a lease is sold, the lessee retains certain rights and is responsible for existing disturbance if present. Once a parcel is leased, the lessee has the right to explore for and develop oil and gas resources, subject to standard lease terms and special stipulations pertaining to the conduct of operations. This chapter addresses the affected area, degree of effects of the Proposed Action and No Action Alternative, and Cumulative Effects to resources expected from this action, combined with past actions, and future actions. Additional site-specific NEPA analysis, based on the project, would address effects of any future exploration, development, or production.

3.2 Affected Environment

An EA must analyze and describe the affected area of the proposed action. The term “Analysis Area” refers to the parts of the Battle Mountain District in which the lease parcels occur. It includes ten parcels in Smoky Valley in Northern Nye and South Lander Counties, one parcel in Fish Creek Valley, Southeast Eureka County within Mount Lewis Field Office and one parcel in Railroad Valley, Nye County Nevada in Tonopah Field Office (Appendix D).

BLM resource specialists prepared this EA to document the analysis of the lease parcels and recommended appropriate stipulations based upon professional knowledge of the areas involved, review of current databases, scientific literature, and file information. At the time of this review, it is unknown whether or not a particular parcel will be sold, and a lease issued. It is also unknown when, where, or if future well sites, roads, and facilities might be proposed; therefore, the types, magnitude and duration of potential impacts cannot be precisely quantified at this time and would vary according to many factors.

This analysis is tiered to the respective RMP for each geographic location of the nominated parcels, and the lease parcels within areas that are open to oil and gas leasing in their respective RMP.

3.3 Environmental Effects

Effects or impacts “means changes to the human environment from the proposed action or alternatives that are reasonably foreseeable and have a reasonably close causal relationship to the proposed action or alternatives, including those effects that occur at the same time and place as the proposed action or alternatives and may include effects that are later in time or farther removed in distance from the proposed action or alternatives” and include “ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic (such as the effects on employment), social, or health effects. Effects may also include those resulting from actions that may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial” (40 CFR 1508.1).

The temporal scale of effects includes the 10-year period of a lease term, unless the lease is held by production, in which case the temporal scale is extended to the life of the producing well. If the lease parcels are developed, short-term effects would be stabilized or mitigated rapidly (within two to five years). Long-term effects are those that would substantially remain for more than five years.

3.4 Cumulative -Past, Present, and Reasonably Foreseeable Future Actions

The Battle Mountain District envelops 10.5 million acres and the BLM has numerous projects that occur throughout this vast area. Past actions include mineral exploration, mining, grazing, recreation, realty and land use actions, mineral sales, and fluid mineral exploration, development, and production. Refer to the next section for the affected environment, environmental effects for presently authorized activities affecting the nominated parcels, and reasonable foreseeable future actions.

Along with oil and gas exploration, development, and production as described under the RFD scenario (Section 2.4), based on recent and current activities the following future actions could occur concurrently in the District during the next 10 years:

- geothermal exploration and development
- mineral exploration and mining
- gravel pit development and production
- solar or wind energy developments
- communication site construction
- road building
- powerline construction
- livestock grazing
- fence construction
- off-highway vehicle use
- non-motorized recreation such as hunting, mountain biking, and geo-caching
- withdrawal of water for irrigation (agriculture) and mining
- wild horse gathers
- noxious weed treatment
- fire suppression and rehabilitation
- construction of wildlife habitat improvement projects

3.5 Supplemental Authorities and Other Resources Considered

To comply with NEPA, BLM is required to address certain elements of the environment that are subject to requirements, called “supplemental authorities,” which are specified in statute, regulation or by executive order (BLM 1988, BLM 1997, BLM 2008). Table 2 outlines these elements. Other resources considered are shown in Table 3. Resources not present or not affected are not addressed further.

Table 2. Supplemental authorities considered in the EA.

Supplemental Authority Element	Not Present	Present/Not Affected	Present/May be Affected	Rationale
Air quality, climate change and greenhouse gases			√	See Sections 3.5.1 and 3.5.2.
Areas of Critical Environmental Concern	√			The proposed lease parcels are not located in or near any established Area of Critical Environmental Concern.
Cultural resources			√	See Section 3.5.10.
Environmental justice		√		An American Indian population is present and is not expected to be disproportionately affected. See Section 3.5.18.
Farmlands, prime or unique	√			There are no Prime or Unique Farmlands, as defined by the Farmland Protection Policy Act, in the BMD.
Noxious weeds and invasive, non-native species			√	See Section 3.5.7.
Native American cultural concerns			√	See Section 3.5.11.
Floodplains			√	See Section 3.5.5.
Riparian/wetlands			√	See Section 3.5.5.
Threatened or endangered species			√	See Sections 3.5.6 and 3.5.8.
Migratory birds			√	See Sections 3.5.8.
Waste, hazardous/solid			√	See Sections 3.5.19.
Water			√	See Sections 3.5.5.
Wild and Scenic Rivers	√			The proposed parcels are not located in or near any designated Wild and Scenic Rivers.
Wilderness and Wilderness Study Areas (WSAs)	√			None of the proposed parcels are within a designated Wilderness or WSA.
Lands with wilderness characteristics			√	See Sections 3.5.14 .

Table 3. Other resources considered in the EA.

Other Resources	Not Present	Present/Not Affected	Present/May be Affected	Rationale
Fire management		√		Standard fire management stipulations would be included in any lease sale. Any potential impacts from subsequent exploration and development activities would be analyzed under a separate, project specific analysis.

Other Resources	Not Present	Present/Not Affected	Present/May be Affected	Rationale
Forestry and woodland products			√	See Section 3.5.5.
Geology and minerals			√	See Section 3.5.15.
Health and Human Safety			√	See Sections 3.5.1, 3.5.19, and 3.5.20.
Land use authorization			√	See Section 3.5.16.
Paleontological resources			√	See Section 3.5.4.
Rangeland resources			√	See Section 3.5.9.
Recreation		√		See Section 3.5.12.
Socioeconomic values			√	See Section 3.5.17.
Soils			√	See Section 3.5.3.
Specially designated areas	√			No specially designated areas were identified during the IDT Review.
Special status species			√	See Section 3.5.6 (plants) and 3.5.8 (animals).
Vegetation			√	See Section 3.5.6.
Visual resources		√		See Section 3.5.13.
Wild horses and burros		√		Three lease sale parcels overlap the Hickison Herd Management Areas (HMAs) in Lander County. The appropriate Management level for this HMA is 16-45 burros and no horses. The estimated population in 2024 is 94 burros and 115 horses. Potential effects to HMAs would be considered at the time of a site-specific proposal. This resource is not analyzed further.
Wildlife			√	See Section 3.5.8.

3.5.1 Air Quality

Affected Environment

Under the authority of the Clean Air Act (CAA), the Environmental Protection Agency (EPA) has established nationwide air quality standards, known as the National Ambient Air Quality Standards (NAAQS) for six air pollutants. Pollutants for which standards have been set are called criteria pollutants, and include carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM₁₀ & PM_{2.5}), sulfur dioxide (SO₂) and lead (Pb). The NAAQS are protective of human health and the environment. Compliance with the NAAQS is typically demonstrated by monitoring for ground-level atmospheric air pollutant concentrations. Areas where pollutant concentrations are below the NAAQS are designated as attainment or unclassifiable, and air quality is generally considered to be good. Locations where monitored pollutant concentrations are higher than the NAAQS are designated nonattainment, and air quality is considered unhealthy.

Two additional pollutants of concern, nitrogen oxides (NO_x) and volatile organic compounds (VOCs) contribute to the formation of ozone in the atmosphere, which is a regulated criteria pollutant.

Additionally, greenhouse gases (GHGs) became regulated pollutants on January 2, 2011, because of their contribution to global climate change.

While the EPA sets the NAAQS and established Federal regulations, many air quality permitting and State Implementation Plan regulatory activities under the CAA are delegated to the state. The Nevada Division of Environmental Protection (NDEP) Bureau of Air Pollution Control and Air Quality Planning (BAPC) is tasked with permitting and maintaining air quality data for Nevada, as well as long-term strategies for air quality improvement. Table 3.3 presents the EPA’s most recent estimate of criteria pollutant sources in Lincoln County from the 2020 National Emissions Inventory (NEI).

Table 4. Sources of Criteria Air Pollution in Battle Mountain District, 2020

Source	tons per year	%
Biogenics (emissions from natural sources)	69,314	58.16%
Industrial Processes other than Petroleum and Natural Gas	29,734	24.95%
Mobile Sources	10,007	8.40%
Agriculture	2,972	2.49%
Wildfire	2,675	2.24%
Fugitive Dust	2,608	2.19%
Residential Fuel Combustion	861	0.72%
Solvent Use	486	0.41%
Oil & Gas Midstream	186	0.16%
Waste Disposal	182	0.15%
Oil & Gas Production	154	0.13%
Commercial Cooking	51	0.04%
Commercial and Industrial Fuel Use	1	0.00%
Total	119,179	100%

Battle Mountain District includes NEI emissions from Esmerelda, Eureka, Lander, and Nye counties. Source: EPA. 2020 National Emissions Inventory (NEI) Online 2020 NEI Data Retrieval Tool. <https://www.epa.gov/air-emissions-inventories/2020-national-emissions-inventory-nei-data>

As shown in Table 4, biogenic sources (natural processes and plants such as pine trees), industrial processes, and mobile sources (vehicles and construction equipment) were the source of more than 97% of the air pollution in Esmerelda, Eureka, Lander, and Nye counties in 2020.

CAA regulations also control the release of hazardous air pollutants (HAPs): chemicals that are known or suspected to cause cancer or other serious health effects, such as reproductive effects, birth defects, or adverse environmental effects. EPA currently lists 189 compounds as HAPs, some of which, such as benzene, toluene, and formaldehyde, can be emitted from oil and gas development operations. NAAQS have not been set for HAPs, rather HAP emissions are controlled by source type- or industrial sector-specific regulations. Hydrogen sulfide (H₂S) gas is not regulated under the NAAQS or as a HAP. However, it is known to be hazardous, and is monitored for health and safety at oil and gas sites. There has been no H₂S discovered in oil wells drilled in Nevada since required monitoring began in 2000.

Table 5. Sources of Hazardous Air Pollution in Battle Mountain District, 2020

Source Category	Tons	%
Biogenics	11,399	96.20%

Industrial Processes other than Petroleum and Natural Gas	0	0.00%
Mobile Sources	187	1.58%
Agriculture	32	0.27%
Wildfire	96	0.81%
Fugitive Dust	0	0.00%
Residential Fuel Combustion	36	0.30%
Solvent Use	71	0.60%
Oil & Gas Midstream	18	0.15%
Waste Disposal	8	0.06%
Oil & Gas Production	3	0.03%
Commercial Cooking	1	0.01%
Commercial and Industrial Fuel Use	0	0.00%
Total	11,848	100%

Source: EPA. 2020 National Emissions Inventory (NEI) Online 2020 NEI Data Retrieval Tool.
<https://www.epa.gov/air-emissions-inventories/2020-national-emissions-inventory-nei-data>

The EPA air quality index (AQI) is used for reporting daily criteria pollutant levels to the public (<https://www.airnow.gov/>). The AQI index is one way to evaluate how clean or polluted an area’s air is and whether associated health effects might be a concern. The EPA calculates a daily AQI based on local air monitoring data. When the AQI value is between 0 and 50, air quality is categorized as “good” and criteria air pollutants pose little or no risk. AQI between 51 and 100 indicates moderate air quality posing little risk. An AQI of 100 indicates at least one pollutant is at the NAAQS concentration. AQI over 100 indicates that at least one pollutant exceeds the NAAQS. Air monitoring data and daily AQIs are available near the proposed lease areas in the counties shown in Table 6. AQI data shows air quality is generally good within the analysis area and that there is little risk to the public from poor air during the most recent 5-year period (2019-2023).

Table 6. Air Quality Index Data 2019-2023

County	Avg Days with AQI per year	Avg Days Rated Good	Avg Days Rated Moderate	Avg Days Rated Unhealthy ¹	% Days Rated Good	% Days Rated Moderate	% Days Rated Unhealthy
Nye	364	335	24	4.4	92.1%	6.7%	1.2%
White Pine	358	290	67	1.2	81.0%	18.7%	0.3%
Average	361	313	46	2.8	86.6%	12.6%	0.8%

1 - Includes days rated Unhealthy for Sensitive Groups, Unhealthy, Very Unhealthy, and Hazardous
Source - AQI by County data downloaded from EPA Air Data
https://aqs.epa.gov/aqswweb/airdata/download_files.html#AQI

Air Quality Related Values (AQRVs) are resources that are sensitive to air quality and include aesthetic values such as visibility and biological and terrestrial resources such as vegetation, soils, water, and wildlife. Air pollution can affect AQRVs through exposure to elevated atmospheric concentrations, such as O₃ effects to vegetation, impairment of scenic views by pollutant particles in the atmosphere, and deposition of air pollutants, such as sulfur and nitrogen compounds, on the earth’s surface through precipitation or dry deposition. AQRVs on federal lands are identified and managed within the respective jurisdictions of several land management agencies in designated Class I areas. Class I areas are afforded

specific AQRV protection under the CAA. There are no Class I areas in or adjacent to the analysis area. The nearest Class I areas are the Hoover Wilderness, approximately 140 miles west-southwest of the southernmost lease parcels, and Yosemite National Park adjacent to the Hoover Wilderness on the west.

Pollutant particles in the atmosphere can impair scenic views, degrading the contrast, colors, and distance an observer is able to see. Visibility is a measure of how far and how well an observer can see a distant and varied scene and can be assessed in terms of the distance that a person can distinguish a large dark object on the horizon; it is measured as the standard visual range in miles. Visibility degradation is primarily due to anthropogenic sulfate, nitrate, particulate emissions, or smoke from wildfires. Air pollutants affecting visibility can be transported hundreds of miles.

A deciview (dv) is a unit of measurement to quantify human perception of visibility. It is derived from the natural logarithm of atmospheric light extinction coefficient. One (1) deciview is roughly the smallest change in visibility (haze) that is barely perceptible. Because visibility at any one location is highly variable throughout the year, it is characterized by three groupings: the clearest 20% days, average 20% days, and haziest 20% days.

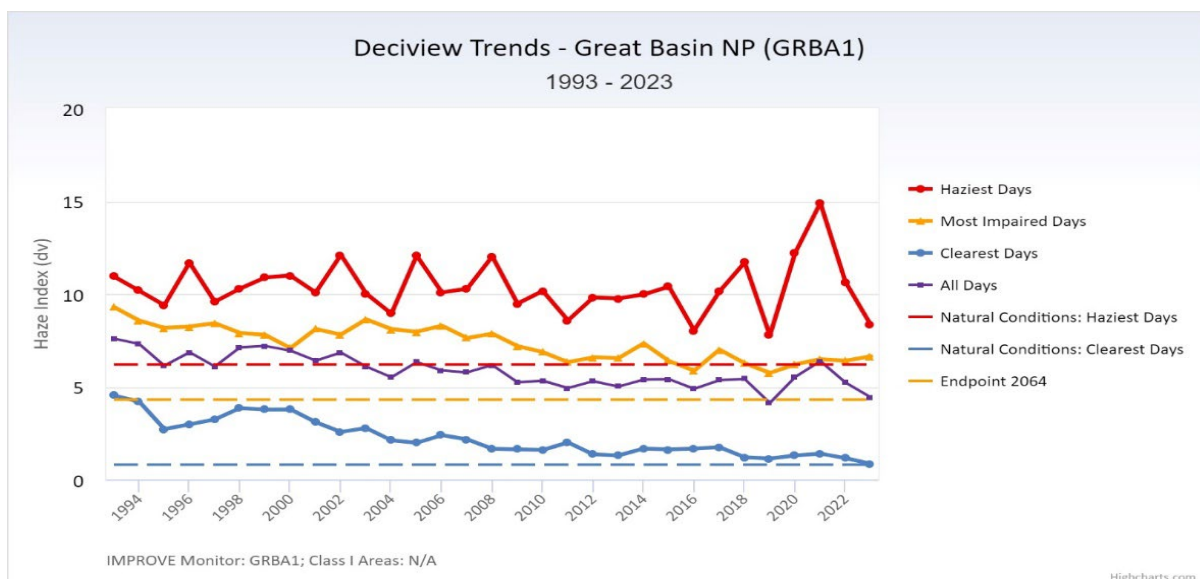


Figure 1. Air quality at Great Basin National Park.

Source: IMPROVE 2024 <http://ista.cira.colostate.edu/Improve/aqr-summary/>

The Great Basin National Park (GBNP), located approximately 140 miles east of the proposed lease sale parcels, is the closest monitoring station for visibility. The figure below shows current visibility trends at GBNP, an area that could potentially be affected from development on proposed lease sale parcels. GBNP is not a Class I area. Visibility in GBNP is generally very good. For context, the 2021 high reading of 15 deciviews recorded in 2021 indicates a visible range of more than 60 miles. The haziest days metric is designed to show the effect of wildfire smoke on visibility. It indicates that the uptick in haze index in 2020 and 2021 may have been due to regional wildfires.

Atmospheric deposition occurs when gaseous and particulate air pollutants are deposited on the ground, water bodies, or vegetation. The pollutants may settle as dust or be washed from the atmosphere in rain, fog, or snow. When air pollutants such as sulfur and nitrogen are deposited into ecosystems, they may cause acidification, or enrichment of soils and surface waters. Atmospheric nitrogen and sulfur deposition may affect water chemistry, resulting in effects to aquatic vegetation, invertebrate communities,

amphibians, and fish. Deposition can also cause chemical changes in soils that alter soil microorganisms, plants, and trees. Although nitrogen is an essential plant nutrient, excess nitrogen from atmospheric deposition can stress ecosystems by favoring some plant species and inhibiting the growth of others.

Environmental Effects of the Proposed Action

Leasing the subject parcels would have no effects on air quality or air quality related values. Any potential effects on air quality would occur if and when the leases are developed for oil and gas activities. Air quality is affected by various natural and anthropogenic factors. Many different sources contribute to local and regional air pollution in Nevada (See Table 5 above). It is unknown if the parcels would be sold and developed, or the extent of development, so it is not possible to feasibly quantify potential air quality effects via methods such as dispersion modeling. Table 7 presents estimated criteria pollutant and HAP emissions related to the reasonably foreseeable development scenario, including well development and production operations emissions at well sites as well as midstream and end-use emissions from crude oil and petroleum product handling, processing and consumption. As shown in the table, these emissions would make up at most 0.3% of expected total emissions in the BMD during any year over the expected 30-year production life of any wells drilled. This small increase in emissions would not be expected to cause a discernable change in air quality.

Table 7. Estimated Maximum Annual Emissions related to Well Development, Production Operations, Mid-stream, and End-use with context, tons per year.

Activity	PM ₁₀	PM _{2.5}	VOC	NO _x	CO	SO ₂	HAPs
Well Development	26.5	3.8	3.6	35.3	22.1	2.5	0.2
Production Operations	17.7	2.0	94.2	4.0	5.7	0.0	11.1
Mid-Stream¹	0.4	0.3	4.0	3.6	2.2	1.0	0.4
End-Use^{2,4}	1.1	0.2	7.3	2.6	87.1	0.1	0.7
Total	45.6	6.3	109.1	45.6	117.2	3.6	12.4
Context							
Battle Mountain District - 2020 Totals³	31,554	4,403	55,647	5,705	21,876	46	11,849
State of Nevada - 2020 Totals³	113,484	26,720	262,929	68,269	403,228	981	56,532
1 - Midstream emissions include transportation, processing and supply-chain emission estimated as the GREET WTW Calculator Well to Pump (WTP) emissions. These emissions come largely from facilities that require an air permit issued under the new source review (NSR) program and the applicable SIP or from vehicles over which BLM has no authority to impose controls. BLM does not have practical control or continuing program responsibility over these emissions.							
2 - End use emissions estimated based on an equivalent volume of gasoline used as modeled by Argonne National Laboratory 2022. GREET WTW Calculator (https://greet.es.anl.gov/tools). BLM does not have practical control or continuing program responsibility over these emissions.							
3 - Total annual pollutant emissions for the Battle Mountain District (Esmerelda, Eureka, Lander, and Nye Counties), and the State of Nevada reported by EPA in the 2020 National Emission Inventory (https://www.epa.gov/air-emissions-inventories/2020-national-emissions-inventory-nei-data)							
4- End-Use HAP emissions estimated as 1/10th of VOC emissions							

The RFD scenario assumes new development would have similar characteristics as prior developments in existing Nevada oil fields, with similar equipment, access roads, and infrastructure. Historically in the lease area 95% of exploration results in dry holes, less than 20% of completed wells produce commercially viable quantities of oil, and no commercial quantities of gas have been discovered. Future effects to air quality, visibility, and atmospheric deposition from leasing and existing development would be similar to past years. Accordingly, estimated emissions presented in Table 7 are conservative and represent a total of 25 wells drilled, with three (3) of those wells coming into production.

Design Constraints

The BLM will mitigate pollutants via lease stipulations and notices and further NEPA actions throughout the lease process. Air quality control measures may be warranted and if so, would be imposed at the APD stage (such as mitigation measures, best management practices (BMPs), and an air emissions inventory). The BLM would do this in coordination with the NDEP BAPC, EPA, and other agencies that have jurisdiction over air quality. At the APD stage, further conditions of approval (COAs) could be applied based on the environmental analysis for the APD. These control measures are dependent on emissions inventory and future modeling studies or other analysis or changes in regulatory standards.

No Action Alternative

Under the No Action Alternative, the parcel(s) would not be leased, and no new foreseeable oil and gas development would occur on the subject lease parcels. As stated in Section 2.2, only those leased lands would see development after undergoing resource review and NEPA analysis.

Cumulative effects

As shown in Table 8, the incremental increase in air emissions related to the proposed action would not be expected to substantially change existing cumulative air emissions or air quality in the region. Air quality regulations implemented by BAPC and the EPA would serve to mitigate the regulated emissions and help maintain the attainment status of the current regional air quality. For example, industrial and mining activities within the analysis area greater than five acres (20 acres for minerals projects) of surface disturbance are required to obtain and operate under an air quality permit from the State of Nevada Bureau of Air Pollution Control (BAPC).

Table 8. Proposed Lease Sale Emissions in Context with Sources of Air Pollution in Battle Mountain District, 2020

Source	Criteria tons per year	%	HAPs tons per year	%
Biogenics	69,314	57.97%	11,399	96.10%
Industrial Processes other than Petroleum and Natural Gas	29,734	24.87%	0	0.00%
Mobile Sources	10,007	8.37%	187	1.58%
Agriculture	2,972	2.49%	32	0.27%
Wildfire	2,675	2.24%	96	0.81%
Fugitive Dust	2,608	2.18%	0	0.00%
Residential Fuel Combustion	861	0.72%	36	0.30%
Solvent Use	486	0.41%	71	0.60%
Proposed Action - Maximum Year	327	0.27%	12.4	0.10%
Oil & Gas Midstream	186	0.16%	18	0.15%
Waste Disposal	182	0.15%	8	0.06%
Oil & Gas Production	154	0.13%	3	0.03%
Commercial Cooking	51	0.04%	1	0.01%
Commercial and Industrial Fuel Use	1	0.00%	0	0.00%
Total	119,558	100%	11,862	100%
Battle Mountain District includes NEI emissions from Esmerelda, Eureka, Lander, and Nye counties. Source: EPA. 2020 National Emissions Inventory (NEI) Online 2020 NEI Data Retrieval Tool. https://www.epa.gov/air-emissions-inventories/2020-national-emissions-inventory-nei-data				

Environmental effects to air quality and climate change within the analysis area from past, present, and reasonably foreseeable future actions include: fugitive dust emissions, including particulate (PM_{2.5} and PM₁₀), combustion emissions from vehicle-based activities such as agriculture, road construction and maintenance, off-highway vehicle (OHV) use, exploration and mining activities, aggregate operations, public land management activities, wildland fire, and greenhouse gas emissions from grazing. Industrial and mining activities within the analysis area greater than five acres (20 acres for minerals projects) of surface disturbance are required to obtain and operate under an air quality permit from the State of Nevada Bureau of Air Pollution Control (BAPC).

3.5.2 Greenhouse Gas (GHG) and Climate Change

Future development of lease parcels under consideration could lead to emissions of carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O), the three most common greenhouse gases associated with oil and gas development. These GHG emissions would be emitted from leased parcels if developed, and from the consumption of any fluid minerals that may be produced. However, the BLM cannot reasonably determine at the leasing stage whether, when, and in what manner a lease would be explored or developed. The uncertainty that exists at the time the BLM offers a lease for sale includes crucial factors that would affect actual GHG emissions and associated impacts, including but not limited to the future feasibility of developing the lease, well density, geological conditions, development type (vertical, directional, or horizontal), hydrocarbon characteristics, specific equipment used during construction, drilling, production, abandonment operations, production and transportation, and potential regulatory changes over the 10-year primary lease term. Actual development on a lease may vary from what is analyzed in this EA and may be evaluated through site-specific NEPA analysis when an operator submits an APD or plan of development to the BLM.

Affected Environment

For the purposes of this analysis, the BLM has evaluated the potential climate change impacts of the proposed leasing action by estimating and analyzing the projected potential GHG emissions from oil and gas development on the parcels. Projected emissions estimates are based on previous actual oil and gas development analyses, and any available information from existing development within the State.

Further discussion of climate change science and predicted impacts, as well as the reasonably foreseeable and cumulative GHG emissions associated with BLM's oil and gas leasing actions and methodologies are included in the *BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends* (BLM, 2023) (Annual GHG Report). This report presents the estimated emissions of greenhouse gases attributable to development and consumption of fossil fuels produced on lands and mineral estate managed by the BLM. The Annual GHG Report is incorporated by reference as an integral part of this analysis and is available at <https://www.blm.gov/content/ghg/2022>.

Climate change is a global process that is affected by the sum total of GHGs in the Earth's atmosphere. GHGs act to contain solar energy loss by trapping longer wave radiation emitted from the Earth's surface and act as a positive radiative forcing component. GHGs influence the global climate by increasing the amount of solar energy retained by land, water bodies, and the atmosphere. GHGs can have long atmospheric lifetimes, which allows them to become well mixed and uniformly distributed over the entirety of the Earth's surface no matter their point of origin. The buildup of these gases has contributed to the current changing state of the climate equilibrium towards warming. A discussion of past, current, and projected future climate change impacts is described in Chapters 4, 8, and 9 of the Annual GHG Report. These chapters describe currently observed climate impacts globally, nationally, and in each State, and present a range of projected impact scenarios depending on future GHG emission levels.

The incremental contribution to global GHGs from a single proposed land management action cannot be accurately translated into its potential effect on global climate change or any localized effects in the area

specific to the action. Currently, global climate models are unable to forecast local or regional effects on resources resulting from a specific subset of emissions. However, there are general projections regarding potential impacts on natural resources and plant and animal species that may be attributed to climate change resulting from the accumulation of GHG emissions over time. In this EA, the BLM uses GHG emissions as a proxy for impacts and provides context with other proxies such as GHG equivalents and the social cost of GHGs.

For the purposes of this EA, the projected emissions from the proposed action can be compared to modeled emissions that have been shown to have definitive or quantifiable impacts on the climate in order to provide context of their potential contribution to climate change. Table 9 shows the total estimated GHG emissions from fossil fuels at the global, national, and state scales over the last five years. Emissions are shown in megatonnes (Mt) per year of carbon dioxide equivalent (CO₂e). Chapter 3 of the Annual GHG Report contains additional information on GHGs and an explanation of CO₂e. State and national energy-related CO₂ emissions include emissions from fossil fuel use across all sectors (residential, commercial, industrial, transportation, and electricity generation) and are released at the location where the fossil fuels are consumed.

Additional information on current state, national, and global GHG emissions as well as the methodology and parameters for estimating emissions from BLM fossil fuel authorizations and cumulative GHG emissions is included in the Annual GHG Report (see Chapters 5,6, and 7). Information on observed and projected climate change effects in Nevada has been developed for the State of Nevada Climate Initiative and is available at <https://extension.unr.edu/publication.aspx?PubID=3957>.

Table 9. Global and U.S. GHG Emissions 2016 - 2021 (Mt CO₂e/yr)

Scale	2017	2018	2019	2020	2021
Global	36,935.6	37,716.2	37,911.4	35,962.9	37,500.0
U.S.	5,787.6	5,837.3	5,726.6	5,097.4	5,489.0
Nevada	44.1	45.4	46.7	42.2	45.4

Source: Annual GHG Report, Chap. 6, Table 6-1 (Global), Inventory of U.S. Greenhouse C=Gas Emissions and Sinks 1990-2022 <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2022> (U.S.) and Nevada Statewide Greenhouse Gas Emissions Inventory and Projections, 2023 Report, www.ndep.nv.gov/uploads/air-pollutants-docs/ghg_report_2023.pdf

Mt (megatonne) = 1 million metric tons

Environmental Effects of the Proposed Action

While the leasing action does not directly result in development that would generate GHG emissions, emissions from future potential development of the leased parcels can be estimated for the purposes of this analysis. There are four general phases of post-lease development processes that would generate GHG emissions: 1) well development (well site construction, well drilling, and well completion), 2) well production operations (extraction, separation, gathering), 3) mid-stream (refining, processing, storage, and transport/distribution), and 4) end-use (combustion or other uses) of the fuels produced. While well development and production operation emissions (phases 1 and 2) occur on-lease and the BLM has program authority over these activities, mid-stream and end-use emissions (phases 3 and 4) typically occur off-lease where the BLM has no program authority.

Emissions inventories at the leasing stage are imprecise due to uncertainties including the type of mineral development (oil, gas, or both), scale, and duration of potential development, types of equipment (drill rig engine tier rating, horsepower, fuel type), and the mitigation measures that a future operator may propose in their development plan. Due to these uncertainties, the BLM applies several assumptions to estimate emissions at the leasing stage. The number of estimated well numbers per parcel are based on State data

for past lease development combined with per-well drilling, development, and operating emissions data from representative wells in the area. The amount of oil or gas that may be produced if the offered parcels are developed is unknown. For purposes of estimating production and end-use emissions, potential wells are assumed to produce oil and gas in similar amounts as existing nearby wells. While the BLM has no authority to direct or regulate the end-use of the products, for this analysis, the BLM assumes all produced oil or gas will be combusted (such as for domestic heating or energy production). The BLM acknowledges that there may be additional sources of GHG emissions along the distribution, storage, and processing chains (commonly referred to as midstream operations) associated with production from the lease parcels. These sources may include emissions of methane (a more potent GHG than CO₂ in the short term) from pipeline and equipment leaks, storage, and maintenance activities. These sources of emissions are highly speculative at the leasing stage; therefore, the BLM has chosen to assume that mid-stream emissions associated with lease parcels for this analysis would be similar to the national level emissions identified by the Department of Energy's National Energy Technology Laboratory (NETL, 2009) (NETL, 2019). Section 6 of the Annual GHG Report includes a more detailed discussion of the methodology for estimating midstream emissions.

The emission estimates calculated for this analysis were generated using the assumptions previously described above using the BLM Lease Sale Emissions Tool. Emissions are presented for each of the four phases of post-lease development described above.

- Well development emissions occur over a short period and may include emissions from heavy equipment and vehicle exhaust, drill rig engines, completion equipment, pipe venting, and well treatments such as hydraulic fracturing.
- Well production operations, mid-stream, and end-use emissions occur over the entire production life of a well, which is assumed to be 30 years for this analysis based on the productive life of a typical oil/gas field.
- Production emissions may result from storage tank breathing and flashing, truck loading, pump engines, heaters and dehydrators, pneumatic instruments or controls, flaring, fugitives, and vehicle exhaust.
- Mid-stream emissions occur from the transport, refining, processing, storage, transmission, and distribution of produced oil and gas. Mid-stream emissions are estimated by multiplying the estimated ultimate recovery (EUR) of produced oil and gas with emissions factors from NETL life cycle analysis of U.S. oil and natural gas. Additional information on emission factors can be found in the Annual GHG report (Chapter 4, Table 4-7 and 4-9).
- For the purposes of this analysis, end-use emissions are calculated assuming all produced oil and gas is combusted for energy use. End-use emissions are estimated by multiplying the EUR of produced oil and gas with emissions factors for combustion established by the EPA (Tables C-1 and C-2 to Subpart C of 40 CFR § 98). Additional information on emission factors and EUR factors can be found in the Annual GHG Report (Chapter 4).

Table 10 lists the estimated annual and production life direct (well development and production operations) and indirect (mid-stream and end-use) GHG emissions in metric tons (tonnes) for the RFD.

Table 10. Estimated Direct and Indirect Emissions from the Lease Parcels on an annual and life of lease basis (Metric Tonnes).

	CO ₂	CH ₄	N ₂ O	CO ₂ e (100-yr)	CO ₂ e (20-yr)
Max Year	25,550	76.64	0.167	27,879	31,918
Average Year	7,672	42.62	0.045	8,954	11,200
Life of Lease	210,638	936.94	1.237	238,896	288,273

Source: BLM Lease Sale Emissions Tool

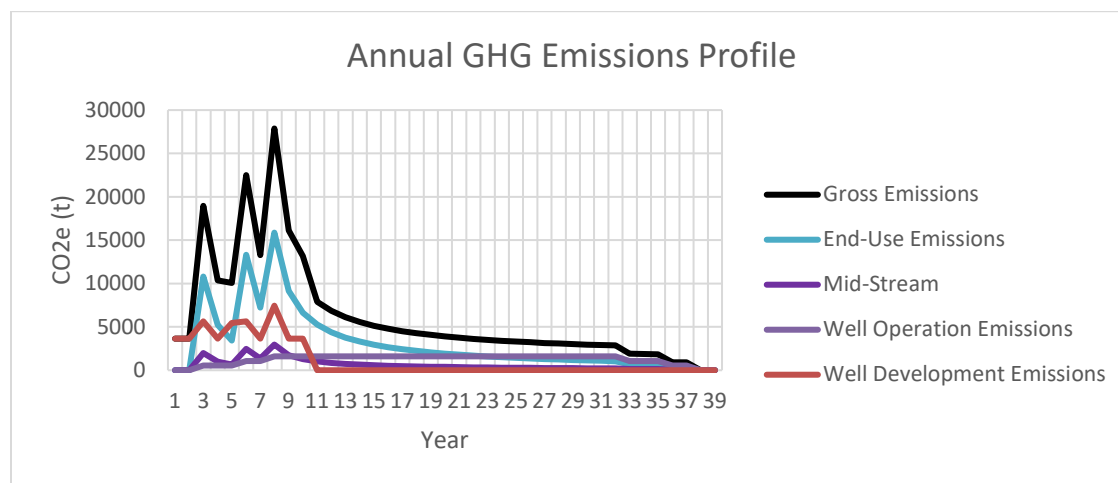
Table 11 presents a breakdown of estimated direct and indirect GHG emissions in metric tons (tonnes) for the RFD over the average 30-year production life of the lease.

Table 11. Estimated Life of Lease Emissions from Well Development, Production Operations, Mid-stream, and End-use (metric tonnes)

Activity	CO ₂	CH ₄	N ₂ O	CO ₂ e (100-yr)	CO ₂ e (20-yr)
Well Development	36,977	299.46	0.226	45,962	61,743
Production Operations	33,874	475.03	0.085	48,053	73,088
Mid-Stream	18,513	158.72	0.282	23,320	31,685
End-Use	121,274	3.73	0.644	121,560	121,757
Total	210,638	936.94	1.237	238,896	288,273
Source: BLM Lease Sale Emissions Tool					

GHG emissions vary annually over the production life of a well due to declining production over time. Figure 5 shows the estimated GHG emissions profile over the production life of a typical lease including well development, well production operations, mid-stream, end-use, and gross (total of well development, well production, mid-stream, and end-use) emissions. In the BMD, as described in Section 3.5.2 and shown on this chart, well development could take as long as ten years and only three of 25 wells are expected to produce oil, thus maximum emissions are reached in year 10 and decline over the life of the lease.

Figure 2. Estimated GHG Emissions Profile over the Life of a Lease.



To put the estimated GHG emissions for this lease sale in a relatable context, potential emissions that could result from development of the lease parcels for this sale can be compared to other common activities that generate GHG emissions and to emissions at the state and national level. The EPA GHG equivalency calculator can be used (<https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>) to express the potential average year GHG emissions on a scale relatable to everyday life. For instance, the projected average annual GHG emissions from potential development of the subject lease are equivalent to 1,930 gasoline-fueled passenger vehicles driven for one year, or the emissions that could be avoided by operating two wind turbines as an alternative energy source or offset by the carbon sequestration of 10,660 acres of forest land. Table 12 compares the estimated annual lease sale related emissions to existing Federal fossil fuel (oil, gas, and coal) emissions, State, and U.S. total GHG emissions.

Table 12. Comparison of Lease Sale Emissions to Other Sources (Megatonnes)

Reference	Mt CO _{2e} ¹ (per year)	Average Year % of Reference
RFD Emissions (Average Year)	0.009	-
NV Onshore Federal²	0.12	7.462%
U.S. Onshore Federal (O&G)	465.63	0.002%
U.S. Federal Onshore and Offshore (O&G)	844.27	0.001%
U.S. Federal Total (O&G and Coal)²	1,292.57	0.001%
U.S. Total, all sectors³	5,489.0	0.0002%

1 - Estimates are based on 100-GWP values.

2 - Federal values come from the BLM Specialist Report on Annual Greenhouse Gas Emissions. Tables ES-1 and ES-2.

3 - U.S. values comes from the EPA Inventory of U.S. GHG Emissions and Sinks: 1990-2022 and use IPCC Fourth Assessment Report Global Warming Potentials. (see page ES-4 for U.S. Total in the EPA, and for state totals see <https://www.epa.gov/ghgemissions/state-ghg-emissions-and-removals>)

The “social cost of carbon”, “social cost of nitrous oxide”, and “social cost of methane” – together, the “social cost of greenhouse gases” (SC-GHG), are estimates of the monetized damages associated with incremental increases in GHG emissions in a given year. This subsection provides estimates of the monetary value of changes in GHG emissions that could result from selecting each alternative. Such analysis should not be construed to mean a cost determination is necessary to address potential impacts of GHGs associated with specific alternatives. While these numbers provide a monetized measure of the net harm to society from emissions, they do not constitute a complete cost-benefit analysis of management actions under considerations and do not present a direct comparison with other impacts discussed in this document. SC-GHG estimates are provided only as a useful measure of the benefits of GHG emissions reductions to inform agency decision-making.

The best currently available estimates of the SC-GHG for use in Department of Interior decision-making and/or analysis are those cited in the Environmental Protection Agency’s Final Rule of March 8, 2024, 89 Fed. Reg. 16820, 17018-20. These estimates reflect recent advances in the scientific literature on climate change and its economic impacts and incorporate recommendations made by the National Academies of Science, Engineering, and Medicine (National Academies 2017)⁴. Technical documentation and additional supporting documents regarding these estimates are available on the EPA webpage⁵.

The EPA’s SC-GHG estimates were developed using complex models which simulates how changes in GHG emissions may affect global temperatures, sea level rise, and other biophysical processes; how these changes may affect human health and infrastructure, as well as the supply of energy, food, and water; and monetize the market and nonmarket impacts associated with these effects. The modular approach employed by EPA to estimate the SC-GHG also includes a discounting module which discounts the stream of future net climate damages back to the year when the additional unit of emissions was released. EPA discounts the future costs of emissions to the emission year using three different near-term target rates (1.5%, 2.0%, and 2.5%) to reflect uncertainty over the starting rate (U.S. EPA 2023). A higher discount rate assumes that future benefits or costs are more heavily discounted than benefits or costs occurring in the present (i.e., future benefits or costs are a less significant factor in present-day decisions).

⁴ National Academies of Sciences, Engineering, and Medicine. 2017. *Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide*. National Academies Press.

⁵ <https://www.epa.gov/environmental-economics/scghg>

The SC-GHG associated with estimated emissions related to the proposed lease sale are reported in Table 13. These estimates represent the present value of future market and nonmarket costs associated with CO₂, CH₄, and N₂O emissions, discounted to 2025 by applying a constant discount rate equal to the near-term target rate to discount costs from the emissions year. Estimates are calculated using EPA’s Workbook and based on BLM’s estimates of emissions in each year. They are rounded to the nearest \$1 million.

Table 13. SC-GHG Associated with Future Potential Development

	Social Cost of All GHG Emission Changes (millions, 2023\$)		
	2.5% near-term Ramsey discount rate	2.0% near-term Ramsey discount rate	1.5% near-term Ramsey discount rate
Development and Operations	\$11.62	\$18.67	\$31.56
Mid-Stream and End-Use	\$20.25	\$33.30	\$57.38
Total	\$31.87	\$51.97	\$88.94

No Action Alternative

Under the No Action Alternative, the BLM would not offer any of the nominated parcels in the lease sale. However, in the absence of a Land Use Plan Amendment closing the lands to leasing, they could be considered for inclusion in future lease sales. Although no new GHG emissions would result under the No Action Alternative, the national and global demand for energy is not expected to differ regardless of BLM decision-making.

The BLM does not have a model to estimate energy market substitutions at a spatial resolution needed for this onshore production scenario. Reductions in oil and natural gas produced from Federal leases may be partially offset by non-Federal production (state and private) in the United States (in which case the indirect GHG emissions would be similar), or overseas, in which case the GHG emissions would likely be higher, to the extent environmental protection requirements for production are less vigorous, and the produced energy would need to be physically transported into the United States. There may also be substitution of other energy resources to meet energy demand. These substitution patterns will be different for oil and gas because oil is primarily used for transportation, while natural gas is primarily used for electricity production and manufacturing, and to a lesser degree by residential and commercial users (AEO, 2023). Coal and renewable energy sources are stronger substitutes for natural gas in electricity generation. The effect of substitution between different fuel sources on indirect GHG emissions depends on the replacement energy source. For example, coal is a relatively more carbon intense fuel than natural gas and hydroelectricity is the least carbon intense energy source (see Table 10-3 of the Annual GHG Report (BLM, 2022)). In the transportation sector, alternatives to oil are likely to be less carbon intensive.

Finally, substitution across energy sources or oil and gas production from other locations may not fully meet the energy needs that would otherwise have been realized through production from these leases. Price effects may lower the market equilibrium quantity demanded for some fuel sources. This would lead to a reduction in indirect GHG emissions. These three effects are likely to occur in some combination under the no action alternative, but the relative contribution of each is unknown. Regardless, GHG emissions under the no action alternative are not expected to be zero.

Cumulative effects

The analysis of GHGs contained in this EA includes estimated emissions from the lease as described above. An assessment of GHG emissions from other BLM fossil fuel authorizations, including coal

leasing and oil and gas leasing and development, is included in the Annual GHG Report in Chapter 7. The Annual GHG Report includes estimates of reasonably foreseeable GHG emissions related to BLM lease sales anticipated during the fiscal year, as well as the best estimate of emissions from ongoing production, and development of parcels sold in previous lease sales. It is, therefore, an estimate of cumulative GHG emissions from the BLM fossil fuel leasing program based on actual production and statistical trends as they are presently known.

The methodologies used in Annual GHG Report provide estimates of foreseeable short-term and projected long-term GHG emissions from activities across the BLM’s oil and gas program. The foreseeable short-term methodology includes a trends analysis of (1) leased federal lands that are held-by-production⁶ (2) approved applications for permit to drill (APDs), and (3) leased lands from competitive lease sales projected to occur over the next annual reporting cycle (12 months). The data is used to provide a 30-year life of lease projection of potential emissions from all Federal oil and gas activities and potential lease actions over the next 12 months. The projected long-term methodology uses oil and gas production forecasts from the Energy Information Administration (EIA) to estimate GHG emissions out to 2050 that could occur from past, present, and future development of Federal fluid minerals. For both methodologies, the emissions are calculated using life-cycle-assessment data and emission factors. These analyses are the basis for projecting GHG emissions from lease parcels that are likely to go into production during the analysis period of the Annual GHG Report and represent both a hard look at GHG emissions from oil and gas leasing and the best available estimate of reasonably foreseeable cumulative emissions related to any one lease sale or set of quarterly lease sales that could occur annually across the entire federal onshore mineral estate.

Table 14 presents the summation of the 30-year life-of-project emissions estimates for both the short and long-term as previously described for each state where federal mineral actions have been authorized. The differences between the short- and long-term emissions estimates can be thought of as an approximation of additional leasing that could occur on federal lands and does not take into consideration additional policies, technological advancements in production or end-use efficiency standards, or an accelerated economy-wide transition away from fossil fuel derived energy production.

A detailed explanation of the short-term and long-term emissions estimate methodologies are provided in sections 6.6 and 6.7 of the Annual GHG Report.

Table 14. GHG Emissions from Past, Present, and Reasonably Foreseeable Federal Onshore Lease Development (Megatonnes CO₂e).

State	Existing Wells (Report Year)	Existing Wells (Projected)	Approved APDs	New Leasing	Short-Term Foreseeable Totals	Long-Term Projected Totals
AL	0.51	7.56	0.00	0.18	7.74	15.28
AK	1.31	19.47	23.13	34.70	77.31	39.67
AZ	0.00	0.00	0.00	0.00	0.00	0.00
AR	0.55	8.72	0.24	0.24	9.19	16.63
CA	4.92	67.90	5.93	2.13	75.96	151.15
CO	46.16	399.35	30.80	23.95	454.10	1,395.90

⁶ [held-by-production](#) - A provision in an oil or natural gas property lease that allows the lessee to continue drilling activities on the property as long as it is economically producing a minimum amount of oil or gas. The held-by-production provision thereby extends the lessee's right to operate the property beyond the initial lease term.

State	Existing Wells (Report Year)	Existing Wells (Projected)	Approved APDs	New Leasing	Short-Term Foreseeable Totals	Long-Term Projected Totals
ID	0.00	0.00	0.00	0.29	0.30	0.01
IL	0.01	0.11	0.00	0.02	0.13	0.26
IN	0.00	0.00	0.00	0.02	0.02	0.00
KS	0.26	3.81	0.00	0.11	3.92	7.80
KY	0.01	0.07	0.00	0.03	0.10	0.25
LA	3.84	48.54	44.95	13.11	106.60	115.95
MD	0.00	0.00	0.00	0.00	0.00	0.00
MI	0.07	1.36	0.00	0.58	1.94	2.11
MS	0.12	1.59	0.38	0.38	2.35	3.62
MT	2.52	25.68	0.42	12.63	38.73	77.12
NE	0.02	0.22	0.00	0.03	0.25	0.47
NV	0.13	1.01	0.01	0.19	1.22	4.07
NM	326.00	2,318.83	745.21	119.12	3,183.17	9,961.81
NY	0.00	0.01	0.00	0.00	0.01	0.01
ND	33.32	279.03	57.62	3.57	340.22	1,020.91
OH	0.40	3.83	0.00	4.64	8.47	12.20
OK	1.25	12.23	0.95	1.66	14.83	37.81
OR	0.00	0.00	0.00	0.12	0.12	0.00
PA	0.00	0.06	0.00	0.67	0.72	0.12
SD	0.11	1.77	0.11	0.11	1.98	3.23
TN	0.00	0.00	0.00	0.00	0.00	0.00
TX	3.31	36.52	19.00	1.97	57.49	99.95
UT	13.90	175.34	16.33	36.75	228.41	421.63
VA	0.01	0.14	0.00	0.03	0.16	0.27
WV	0.00	0.06	0.00	0.59	0.65	0.14
WY	103.34	920.76	178.16	317.98	1,416.91	3,134.55
Total Onshore Federal	542	4,334	1,123	576	6,033	16,523

Source: BLM Annual GHG Report, Section 7

As detailed in the 2022 Annual GHG Report, which the BLM has incorporated by reference, the BLM also looked at other tools to inform its analysis, including the [Model for the Assessment of Greenhouse Gas Induced Climate Change \(MAGICC\)](#) (see Section 9.0 of the Annual GHG Report). BLM conducted MAGICC runs evaluating potential contributions to global climate change and related values for two climate change projection scenarios. These two scenarios were chosen because they most closely approximate or frame the desired outcomes of the Paris Climate Accord and would also reflect the greatest contribution as a percent of BLM's authorized cumulative emissions relative to the global emissions levels contained in the scenarios. IPCC's most optimistic scenario evaluates global CO2 emissions cut to net zero around 2050. This is the only scenario that meets the Paris Agreement's

goal of keeping global warming to around 1.5 degrees Celsius above pre-industrial temperatures. The second “middle of the road” scenario leaves global CO₂ emissions around current levels before starting to fall by 2050 but does not reach net-zero by 2100. In this scenario, temperatures rise 2.7 degrees C by the end of the century. The maximum BLM fossil fuel (oil, gas and coal) contribution to global temperature increases under these two scenarios is 0.015 C and 0.013 C, respectively. This is an assessment of what BLM has projected could come from the entire Federal fossil fuel program, including the projected emissions from the leases, over the next 30 years.

Recent short-term energy outlook reports (STEO) published by the EIA (<https://www.eia.gov/outlooks/steo/>) (EIA, 2023) predict that the world’s oil and gas supply and consumption will increase over the next 18-24 months. The STEO projections are useful for providing context for the cumulative discussion as the global forecast models used for the STEO are not dependent on whether the BLM issues onshore leases but are based on foreseeable short-term global supply and demand and include oil and gas development /operations on existing U.S. onshore leases. Recent STEOs includes the following projections for the next two years:

- U.S. liquid fuels consumption is projected to increase to 20.40 million barrels per day (b/d) in 2024 up from 20.25 million b/d in 2023.
- U.S. crude oil production is expected to average 13.19 million b/d in 2024 and rise to 13.65 million b/d in 2025.
- U.S. natural gas consumption is expected to average 89.68 Bcf/d in 2024, decreasing slightly to 89.21 Bcf/d in 2025.
- U.S. LNG exports are expected to increase from 11.9 billion cubic feet/day (Bcf/d) in 2023 to 12.34 Bcf/d in 2024 and 14.43 Bcf/d in 2025.
- U.S. Coal production is expected to total 496.6 million short tons (MMst) in 2024 and 465.8 MMst in 2025 and decrease to 15% of total U.S. electricity generation in 2024 compared to 17% in 2023 driven by on-going retirement of coal-fired generating plants.

Generation from renewable sources will make up an increasing share of total U.S. electricity generation, rising from 21% in 2023 to 24% in 2024. Recent events, both domestically and internationally, have resulted in abrupt changes to the global oil and gas supply. EIA studies and recent U.S. analyses (associated with weather impacts, etc.) regarding short-term domestic supply disruptions and shortages or sudden increases in demand demonstrate that reducing domestic supply (in the near-term under the current supply and demand scenario) will likely lead to the import of more oil and natural gas from other countries, including countries with lower environmental and emission control standards than the United States (EIA, 2023). Recent global supply disruptions have also led to multiple releases from the U.S. Strategic Petroleum Reserve in order to meet consumer demand and curb price surges.

The EIA 2023 Annual Energy Outlook (<https://www.eia.gov/outlooks/aeo/>) projects energy consumption increases through 2050 as population and economic growth outweighs efficiency gains. As a result, U.S. production of natural gas and petroleum and liquids will rise amid growing demand for exports and industrial uses. U.S. natural gas production increases by 15% from 2022 to 2050. However, renewable energy will be the fastest-growing U.S. energy source through 2050. As electricity generation shifts to using more renewable sources, domestic natural gas consumption for electricity generation is expected to decrease by 2050 relative to 2022. As a result, energy-related CO₂ emissions are expected to fall 25% to 38% below 2005 level, depending on economic growth factors. Further discussion of past, present and projected global and state GHG emissions can be found in Chapter 5 of the Annual GHG Report.

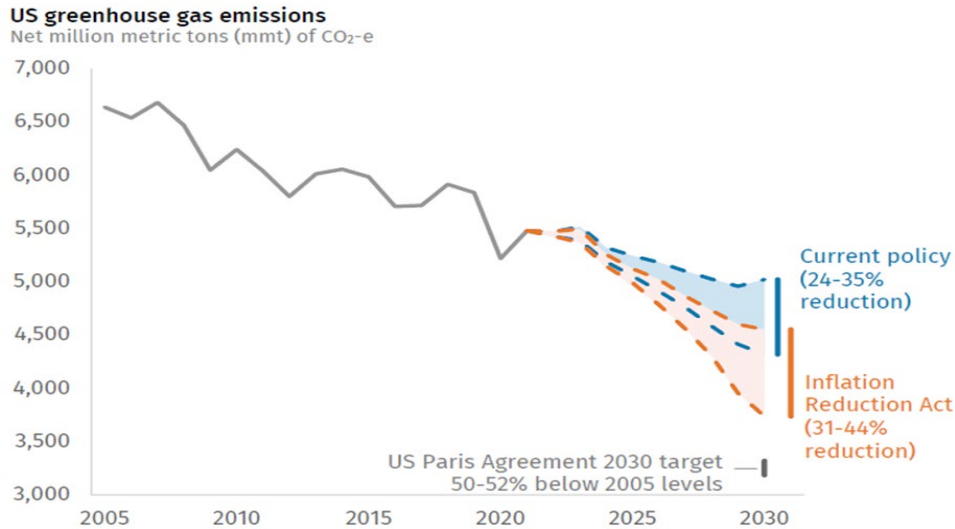
Executive Order 14008, "Tackling the Climate Crisis at Home and Abroad" (January 27, 2021), directs the executive branch to establish policies or rules that put the United States on a path to achieve carbon neutrality, economywide, by no later than 2050. This goal is consistent with IPCC’s recommendation to reduce net annual global CO emissions between 2020 and 2030 in order to reach carbon neutrality by mid-century. Federal agencies are still in the process of developing policies that align with a goal of

carbon neutrality by 2050. In the short-term, the order has a stated goal of reducing economy wide GHG emissions by 50 to 52% relative to 2005 emissions levels no later than 2030.

Carbon budgets are an estimate of the amount of additional GHGs that could be emitted into the atmosphere over time to reach carbon neutrality while still limiting global temperatures to no more than 1.5°C or 2°C above preindustrial levels (see section 9.1 of the Annual GHG Report (BLM, 2023)). The IPCC Special Report on Global Warming of 1.5°C is the most widely accepted authority on the development of a carbon budget to meet the goals of the Paris Agreement. None of the global carbon budgets or pledges that countries have committed to stay within as part of the Paris Agreement are binding. At present, no national or Federal agency carbon budgets have been established, primarily due to the lack of consensus on how to allocate the global budget to each nation, and as such the global budgets that limit warming to 1.5 °C or 2.0 °C are not useful for BLM decision making, particularly at the leasing stage, as it is unclear what portion of the budget applies to emissions occurring in the United States.

The Council on Environmental Quality discourages Federal agencies from comparing emissions from an action to global or domestic levels as “such comparisons and fractions also are not an appropriate method for characterizing the extent of a proposed action's and its alternatives' contributions to climate change because this approach does not reveal anything beyond the nature of the climate change challenge itself (CEQ, 2023).” However, stakeholders and members of the public have requested that the BLM consider comparing the estimated Federal oil and gas emissions in the context of global carbon budgets. In the interest of public disclosure, Table 9-1 in the Annual GHG Report provides an estimate of the potential emissions associated with Federal fossil fuel authorizations in relation to IPCC carbon budgets. Total Federal fossil fuel authorizations including coal, natural gas and oil represents approximately 1.37 % of the remaining global carbon budget of 380 GtCO₂ needed to limit global warming to 1.5 C.

While continued fossil fuel authorizations will occur over the next decade to support energy demand and remain in compliance with the leasing mandates in the Inflation Reduction Act (IRA) passed in 2022, the U.S. Energy Information Administration International Energy Outlook expects renewable energy consumption to double between 2020 and 2050 and nearly equal liquid fuels consumption by 2050. The U.S. has committed to the expansion of renewable energy through infrastructure investments in clean energy transmission and grid upgrades include in the Bipartisan Infrastructure Investment and Jobs Act as well as clean energy investments and incentives included in the Inflation Reduction Act.



Source: Rhodium Group. The range reflects uncertainty around future fossil fuel prices, economic growth, and clean technology costs. It corresponds with high, central, and low emissions scenarios detailed in [Taking Stock 2022](#). Under the central scenario (not shown), the IRA accelerates emissions reductions to a 40% cut from 2005 levels.

Figure 3. Projected Short-Term Emissions Reductions Associated with the IRA

Mitigation Strategies

The relationship between GHG emissions and climate impacts is complex, but a project’s potential to contribute to climate change is reduced as its net emissions are reduced. When net emissions approach zero, the project has little or no contribution to climate change. Net-zero emissions can be achieved through a combination of controlling and offsetting emissions. Emission controls (e.g., vapor recovery devices, no-bleed pneumatics, leak detection and repair, etc.) can substantially limit the amount of GHGs emitted to the atmosphere, while offsets (e.g., sequestration, low carbon energy substitution, plugging abandoned or uneconomical wells, etc.) can remove GHGs from the atmosphere or reduce emissions in other areas. Chapter 10 of the Annual GHG Report provides a more detailed discussion of GHG mitigation strategies.

Several Federal agencies work in concert to implement climate change strategies and meet U.S. emissions reduction goals all while supporting U.S. oil and gas development and operations. The EPA is the Federal agency charged with regulation of air pollutants and establishing standards for protection of human health and the environment. The EPA has issued regulations that will reduce GHG emissions from any development related to the proposed leasing action. These regulations include the New Source Performance Standard for Crude Oil and Natural Gas Facilities (40 CFR 60, OOOOa), Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After November 15, 2021 (40 CFR 60, OOOOb) and Waste Emissions Charge for Petroleum and Natural Gas Systems (40 CFR 99). These regulations impose emission limits, equipment design standards, and monitoring requirements on oil and gas facilities and a waste emissions charge on methane emissions that exceed 25,000 metric tonnes of CO₂e for applicable petroleum and natural gas facilities currently required to report under the Greenhouse Gas Reporting Rule. A detailed discussion of existing regulations and Executive Orders that apply to BLM management of federal lands as well as current Federal and state regulations that apply to oil and gas development and production can be found in Chapter 2 of the Annual GHG Report.

The majority of GHG emissions resulting from federal fossil fuel authorizations occur outside of the BLM’s authority and control. These emissions are referred to as indirect emissions and generally occur off-lease during the transport, distribution, refining, and end-use of the produced federal minerals. The BLM’s regulatory authority is limited to those activities authorized under the terms of the lease, which

primarily occur in the “upstream” portions of natural gas and petroleum systems (i.e., the well-development and well-production phases). This decision authority is applicable when development is proposed on public lands and the BLM assesses the specific location, design and plan of development. In carrying out its responsibilities under NEPA, the BLM has developed Best Management Practices (BMPs) designed to reduce emissions from field production and operations. BMPs may include limiting emissions from stationary combustion sources, mobile combustion sources, fugitive sources, and process emissions that may occur during development of the lease parcel. Analysis and approval of future development may include the application of BMPs within BLM’s authority, included as Conditions of Approval, to reduce or mitigate GHG emissions. Additional measures proposed at the project development stage may be incorporated as applicant-committed measures by the project proponent or added to necessary air quality permits. Additional information on mitigation strategies, including emissions controls and offset options, are provided in Chapter 10 of the Annual GHG Report.

3.5.3 Soils

Affected Environment

Differences in climate, relief, aspect, slope, landform, elevation, and parent material among other factors contribute to the formation of different soil types. Soils in the analysis area are principally those found in valley floors, deep and poorly drained due to high clay content with a highly alkali pH.

Existing soils surveys are used to for evaluating land-use potential, potential plant communities and developing reclamation and rehabilitation plans. Three major soil orders dominate the Analysis Area: Aridisols, Entisols, and Inceptisols. A brief description of each soil order is provided in Appendix F.

The additive effects of oil and gas exploration and development on soils are generally expected to be minimal due to the relatively small area of disturbance in the RFD timeframe, concurrent reclamation, and the development of site-specific mitigation and BMPs. The Water Resources Stipulation and development away from wetlands and riparian soils and vegetation further reduces effects to these resources. Development for any purpose removes available vegetation and increases the susceptibility of soil to wind and water erosion, soil compaction and invasion by invasive species, and disturbs microbiotic crusts and topsoil.

Environmental Effects of the Proposed Action

Future projects on any leased parcels could affect soils. These might include activities such as seismic studies, exploratory drilling, developing a well for production (with or without using Hydraulic Fracturing (HF)), production infrastructures, road construction, and gravel pit expansion. These actions would remove vegetation, potentially increasing wind, and water erosion; cause soil compaction; and disturb microbiotic crusts and topsoil. Removal of topsoil would change soil texture and structure by mixing soil horizons and breaking up soil aggregates. The effects of surface disturbance would include changes in nutrient and water cycling, bulk density, water holding capacity, percent organic matter, and microbial activity. Removal and crushing of vegetation would occur through exploration and development activities. Considering the amount of disturbance anticipated in the RFD scenario, the effects to soils are expected to be comparatively minor when compared to the areas offered for lease and temporary in nature because much of the disturbance (roads and pads) would be reclaimed.

Effects to soil from these activities would be analyzed under additional site-specific EAs when an action is proposed and specifics such as location, well depth, water consumption needs, and area of disturbance are known. Through this process, specific mitigation measures and BMPs would be attached as Conditions of Approval (COAs) for each proposed activity.

Concurrent reclamation would be completed for all producing well locations; this feature would provide improved soil stability onsite and control of any soil erosion that may take place. Also, native vegetation

would be restored during concurrent reclamation, partially restoring the site's vegetative productivity. As for final reclamation, sufficient topsoil would be maintained, allowing the site to be restored to its original landform; and native seed would be used, restoring the site's full vegetative productivity.

A CSU stipulation for slopes greater than 30 percent requires engineering and reclamation that would avoid impacts, wherever these slopes exist on a parcel. Using GIS all proposed parcels were examined for slopes greater than 30 percent, and none were found to meet the criteria for the stipulation. Sensitive riparian/wetland area soils generally have high susceptibility to disturbance and alteration; these would be protected by the Water Resources stipulation, NV-B-10-B-CSU, which is applied to all or part of eleven parcels. The degree of protection would be adequate because vulnerable soils would not be expected to extend beyond the area within which impacts would not be allowed (within 500 feet of wetland/riparian areas, floodplains or playas).

No action alternative

The No Action Alternative would not impact cultural resources. Activities on currently leased parcels adjacent to the proposed parcels would remain on-going as permitted on surrounding federal, state, and private lands.

Cumulative Effects

The disturbance associated with oil and gas exploration and production would add to the disturbances from mining exploration, mine development, grazing management, wildfires, fire rehabilitation, range improvement projects, and previous oil and gas and geothermal exploration. Creating new roads, constructing drill pads and developing wells and mines removes available vegetation and increases the susceptibility of soil to wind and water erosion, soil compaction and invasion by invasive or non-native species, and disturbs microbiotic crusts and topsoil. However, the cumulative impacts of oil and gas exploration and development on soils are generally expected to be minimal due to the relatively small area of disturbance in the RFD timeframe, concurrent reclamation, and the development of site-specific mitigation and BMPs.

3.5.4 Paleontological Resources

Affected Environment

Paleontological resources are defined in the federal Paleontological Resources Preservation Act (PRPA [also commonly known as the Omnibus Act]) as the "fossilized remains, traces, or imprints of organisms, preserved in or on the earth's crust, that are of paleontological interest and that provide information about the history of life on earth" (16 United States Code [U.S.C.] 470aaa[1][c]). Formations or rock units which are known to yield vertebrate or significant invertebrate, plant, or trace fossils, have a high potential for containing significant paleontological resources. The rock units within the nominated parcels have unknown to moderate potential for significant paleontological resources.

Environmental Consequences of the Proposed Action

Paleontological resources may be subject to impacts from oil and gas exploration and development activities; therefore, identification and evaluation of these resources would be required on a case-by-case basis prior to project implementation or ground disturbing activities. BLM Instruction Memorandum (IM) No. 2009-011 provides guidelines for assessing potential impacts to paleontological resources in order to determine mitigation steps for federal actions on public lands under FLPMA (Public Law [PL] 94-579, codified at 43 U.S.C. 1701-1782 and 18 U.S.C. 641) and NEPA. This IM also provides procedures for field survey and monitoring to avoid adversely affecting significant paleontological resources.

To help minimize any potential effects to paleontological resources, a standard Lease Notice, NV-B-00-A-LN, regarding fossils is attached to all parcels. This informs lessees of requirements to inform the BLM

of fossil discoveries, and requirements for surveys, avoidance and/or data recovery prior to their disturbance. On-site monitoring may be necessary during construction activities.

Additionally, Lease Stipulation (NV-B-08-A-NSO) may be attached to all parcels within the limits of identified paleontological resource occurrences classified by WO-IM-2008-009 (Potential Fossil Yield Classification [PFYC] System for Paleontological Resources on Public Lands) as PFYC 5 (being of scientific or educational interest). These areas have very high potential for significant paleontological resources or are known to contain significant paleontological resources of scientific or educational importance, and protected by Public Law 111-11, Paleontological Resources Preservation Act. Any quarter-quarter-quarter section (10-acre parcel) within or intersected by the limits of the site are subject to NSO.

Based on the above requirements, it is unlikely that the affected area and degree of effects to paleontological resources from leasing the parcels would be substantial.

No action alternative

The No Action Alternative would create no additional impacts to paleontological resources in the analysis area. Activities on areas adjacent to the proposed parcels would remain on-going as permitted on surrounding federal, state, and private lands.

Cumulative Effects

Several ongoing and potential actions in the area, such as mining, solid and fluid mineral exploration, off-highway vehicle use, and livestock grazing, have the potential to impact paleontological resources. The geographic scope or extent of impacts for paleontological resources is generally the geographic formation in question. None of the proposed parcels have been surveyed to determine the boundaries and geographic extent of fossil resources or any paleontological localities. Parcels identified as having low potential for containing significant paleontological resources would not be subject to effects; however, BMPs and COAs would apply in the event a significant paleontological resource was encountered as a result of any ground-disturbing oil and gas exploration or development activities. Parcels identified as having unknown or moderate to high potential for containing significant paleontological resources may require a field determination to map locations of any vertebrate fossils or any scientifically significant fossils. Once mapped, the geographic and temporal scope for paleontological resources can be defined, followed by an analysis to determine what, if any, impacts there would be to significant paleontological resources resulting from past, present, or reasonably foreseeable actions in the analysis area. It is expected that the proposed action may contribute to impacts through the reasonably foreseeable role of oil and gas exploration and development; however, with implementation of appropriate mitigation, BMPs, and the COAs, impacts may be avoided.

3.5.5 Water

The proposed lease parcels occur in the Basin and Range Physiographic Province, a semiarid and arid desert environment with most precipitation originating as snow or occasional monsoon rainfall. As defined by the Nevada Division of Water Resources (NDWR; <http://water.nv.gov/>), the parcels occur in Hydrographic Region 16, and more specifically Hydrographic Areas: the Little Smoky Valley—Northern Part (ID #155A), Big Smoky Valley (ID #137B), and Railroad Valley (ID #173B) (Table 6). Located about 12 miles southeast from parcel 6968, across the Railroad Valley basin, the daily Blue Eagle weather station indicates an average annual precipitation equaling 8.5 inches, with snowfall generally occurring from November through April. The highest and lowest temperatures respectively are reached in July (average 94.7°F) and January (average 16.5°F) (Western Regional Climate Center, 1978-2016). Evapotranspiration rates in the vicinity of the proposed lease parcels range from about 4.6 to 4.9 acre-feet each year (Nevada Division of Water Resources (NDWR), 2020).

Affected Environment

Surface water and Groundwater: Water is a fundamental component of ecosystem health, especially in arid regions where state appropriative water rights, groundwater aquifers, springs, seeps, wetland and riparian areas, and ephemeral and perennial streams are essential to biodiversity including playing an important role in wildlife habitat and in the food chain for many wildlife taxa. Water quality is critical as surface waters support a variety of uses, exemplified in the three said Hydrographic Areas including (enumerated by NDWR) commercial, domestic, irrigation, mining and milling, municipal, recreation, and stock water (Table 15).

While water quantity is mapped and characterized by the NDWR, surface water and groundwater quality is administered by the Nevada Division of Water Quality (NDWQ), a part of the Nevada Division of Environmental Protection (NDEP). The surface water quality standards of Nevada support Federal laws such as the Water Resources Planning Act of 1962, the Clean Water Act of 1977, the Safe Drinking Water Act (SDWA) of 1977, and the Pollution Prevention Act of 1990, all of which are administered by the Nevada Division of Water Quality (NDWQ), a part of the Nevada Division of Environmental Protection (NDEP). In addition, Nevada's groundwater quality standards are based on the assumption that groundwater should be maintained suitable for use as a drinking water source if not prevented by natural conditions. The State adopts the Federal primary and secondary drinking water standards (maximum contaminant limits) for groundwater resources set by the Environmental Protection Agency (EPA) under the SDWA. The chemical character and quality of groundwater varies in and near the proposed lease parcels, largely depending on the mineral content of the rock, residence time, evapotranspiration, and temperature.

Most of the parcels occur within the 100-year flood plain and include and/or are near surface water features, including perennial waters, ponds, springs/seeps, points of diversion such as wells, and wetland (also playas)/riparian areas (Table 16). Many features result from hydrologic/hydrogeologic conditions (e.g., artesian flow) near the break in slope along the margin of alluvial fans and pediments and basin fill including playa deposits; slopes are much less than a 30 percent, and thus don't meet the BLM #NV-B-11-A-CSU stipulation. Surface water runoff may infiltrate the basin fill, and thus contributing inflow to the basin groundwater systems, or be transferred to the atmosphere through evapotranspiration. Perennial spring base flow is largely driven by groundwater recharge from rainfall, snowfall, and snowmelt. Depth to groundwater varies from less than a foot to hundreds of feet depending on location. Examples of surface water bodies include perennial Fish Creek of the Little Smoky Valley, multiple springs and seeps between the termini of perennial Bowman and Kingston Creeks of the Big Smoky Valley, and Big Well Ponds of the Railroad Valley Wildlife Management Area.

Riparian/Wetland Zones/Springs/Seeps: Riparian and wetland areas are productive and important ecosystems in the Battle Mountain District Office (BMDO). Many such areas, which often comprise water bodies in and near the proposed lease parcels such as springs, seeps, ponds, and perennial streams, are controlled by the local geology. Control includes both stratigraphy where a break in slope occurs at the juncture of alluvial fans and pediments and basin fill deposits and structural features such as fractures and faults that control/route and/or concentrate the flow of surface water and/or groundwater. While representing less than one percent of the area in the BMDO, riparian and wetland areas contain a significant portion of the biodiversity and perform vital ecologic functions. Such habitat characteristically has a greater diversity of plant and animal species than adjoining areas (Gregory et al., 1991; Chambers et al., 2004). According to the National Wetlands

Inventory, wetland/riparian areas and/or springs and seeps occur within 500 feet of six parcels proposed for lease (i.e., Table 16—2095, 2097, 2106, 2112, 6968).

Table 15. Nevada Division of Water Resources (NDWR) Basins, Size, and Perennial Yield for Parcels.

NDWR Hydrographic Area	Parcel #	Size of Basin (Sq. Mi.)	Perennial Yield (Acre-Feet)	Manner of Use
Little Smoky Valley (Northern Part) – 155A	1994	580	5,000	Irrigation and Stockwater
Big Smoky Valley (Northern Part) – 137B	2095, 2097, 2100, 2102, 2104, 2106, 2107, 2112, 7030, 7031	1,315	65,000	Irrigation, Mining and Milling, Quasi-Municipal, and Stockwater
Railroad Valley (Northern Part) – 173B	6968	2,140	75,000	Commercial, Industrial, Irrigation, Mining and Milling, Quasi-Municipal, Recreation, and Stockwater

Table 16. Proposed lease parcels with respective Nevada Division of Water Resources (NDWR; <http://water.nv.gov/>) Hydrographic Area, Bureau of Land Management water-resource stipulations, and hydrological/geological description.

NDWR Hydrographic Area	Parcel #	Bureau of Land Management Water-Resource Stipulations (#NV-B-10-B-CSU): Avoid impacts to 100-yr flood plains, and playas, areas within 500 feet of perennial waters, springs, points of diversion (POD, including wells as administered by the NDWR), and wetland (also playas)/riparian areas, and areas from 150 feet (for groundwater sources and related places of use) to as much as 500 feet (for surface water sources and related places of use) where the BLM holds state appropriative water rights.	Hydrologic/Geologic Description
Little Smoky Valley (Northern Part) -155A	1994	Occurs within 100-yr flood plain and 500 feet of perennial waters and a NDWR-permitted POD stock water well.	Basin fill, including alluvial fan and fluvial deposits with nearby perennial streams and springs and seeps.
Big Smoky Valley (Northern Part)-137B	2095	Occurs within 100-yr flood plain and 500 feet of perennial waters (lakes/ponds and springs/seeps), NDWR-permitted PODs (stock water wells and BLM), and wetland/riparian areas. It also meets the BLM-related latter part of the stipulation.	Basin fill, including alluvial fan deposits within or near perennial stream, wetlands, swamp/marsh, and springs and seeps.

	2097	Occurs within 100-yr flood plain and 500 feet of perennial waters, springs/seeps, NDWR-permitted POD stock water well, and wetland/riparian areas.	Basin fill, including playa/wetlands, swamp/marsh, and springs and seeps.
	2100	Occurs within 100-yr flood plain and 500 feet of perennial waters and NDWR-permitted POD irrigation wells.	Basin fill, including alluvial fan deposits dissected by a perennial stream.
	2102		Basin fill, including mostly alluvial fan deposits.
	2104	Occurs within 100-yr flood plain and 500 feet of perennial waters, springs, and NDWR-permitted PODs (including stockwater well and BLM). It also meets the BLM-related latter part of the stipulation.	Basin fill, including alluvial fan deposits cut by a perennial stream and spring(s).
	2106	Occurs within 100-yr flood plain and 500 feet of springs, NDWR-permitted PODs (including stockwater well and BLM), and wetland/riparian areas. It also meets the BLM-related latter part of the stipulation.	Basin fill, including alluvial fan and fluvial deposits and wetlands and spring(s).
	2107	Occurs within 100-yr flood plain and 500 feet of a NDWR-permitted POD stockwater well.	Basin fill, including alluvial fan and fluvial deposits.
	2112	Occurs within 100-yr flood plain and 500 feet of NDWR-permitted PODs (including stockwater well and BLM) and wetland/riparian areas. It also meets the BLM-related latter part of the stipulation .	Basin fill including wetlands.
	7030	Occurs within 100-yr flood plain.	Basin fill, including alluvial fan and fluvial deposits.
	7031	Occurs within 100-yr flood plain.	Basin fill, including distal alluvial fan and fluvial deposits.
Railroad Valley (Northern Part)-173B	6968	Occurs within 100-yr flood plain and 500 feet of wetlands (also playa) and a NDWR-permitted POD stockwater well. Includes historical oil and gas activities (referred to as Trap Spring Oil Field—Bortz, 2016).	Basin fill, including alluvial fan deposits, and/or playa/wetlands with nearby and downslope wetlands (including playa), lakes/ponds, and springs/seeps.

State Appropriative Water Rights: State appropriative water rights, surface waters, and groundwater in the lease area are owned by the people of Nevada; however, the right to use surface water and groundwater and management of water appropriations are administered by and issued by the State Engineer at the NDWR. Any entity can apply and secure appropriative water rights from the NDWR, including the BLM. BLM water rights, where secured and beneficially used, can support a variety of uses including wild horses and burros, wildlife, grazing, mining, recreation, and firefighting. Perfected BLM water rights are often an important property right to hold that support multiple use and sustained yield of resources from Federal lands in the arid west.

Where secured by any entity, state appropriative water rights that are beneficially used promote land uses based on the prior appropriation doctrine, or “first in time-first in right.’ Thus, the older the water right, the more seniority the water use and water right holder must protect its right from other uses and over-

appropriation of surface and groundwater resources that would limit or end the water source's use. Proposed lease parcels are located in the three NDWR Hydrographic Areas listed in Table 15. Nine of the proposed lease parcels (Table 16) 1994, 2095, 2097, 2100, 2104, 2106, 2107, 2112, 6968) have NDWR permitted water rights located within 500 feet mostly used for stock water. Numerous NDWR permitted recreational wells related to the Railroad Valley Wildlife Management Area (including those water rights permitted for recreation and wildlife undersigned by Nevada Department of Wildlife) are located directly to the southeast and downgradient of proposed lease parcel 6968, though beyond 500 feet.

Environmental Effects of the Proposed Action on Water Resources

All oil and gas exploration and production are subject to Best Management Practices (BMPs), State and Federal Regulations, and Conditions of Approval (COAs). Potential future impacts of developing a lease may include degradation of surface water and groundwater quality, drawdown of existing water levels, and/or possible impacts to drinking water sources should such sources exist nearby, as when linked to fracking activities. Water quality issues may arise from either underground or surface contamination. Surface activities can degrade groundwater quality by infiltration of contaminants, particularly from sumps and spills or possibly from hydraulic fracturing fluids.

Hydraulic Fracturing (HF) is one method of well stimulation used in oil and gas production, though in Nevada only five wells have used HF and only one was successful. HF is designed to change the producing formations' physical properties by increasing the flow of water, gas, and/or oil around the wellbore. This change in physical properties may form new fractures or enhance/reactivate existing fractures and faults that could result in freshwater aquifers being contaminated by natural gas, condensate, and/or chemicals used in drilling, completion operations, and HF. Impacts to groundwater resources have been mostly due to improper well construction including insufficient or poorly installed surface and/or borehole seals (cementing), improper construction materials, inadequate construction practices, and/or introduction of contaminants into groundwater through spills and/or loss of drilling and hydraulic fluids. Areas with shallow groundwater levels would be at greater risk and may be subject to COAs. Types of chemical additives used in completion activities may include acids, hydrocarbons, gelling or thickening agents, lubricants, and other additives that are specific for the well being treated.

The potential for negative impacts to groundwater caused by HF are continually being investigated by the Environmental Protection Agency. Onshore Oil and Gas Order #1 specifies that lessees and operators must comply with applicable state laws on federal leases (48 FR 56226, Dec. 20, 1983). All HF operations are subject to the requirements of the State of Nevada, Adopted Regulation of the Commission on Mineral Resources R011-14, which hold the operator to a higher standard than the BLM's proposed HF rules. The Nevada HF rules require the use of multiple steel casing strings (Surface, Intermediate, and Production) with proper cementing jobs (plus required testing for efficacy) to isolate any usable groundwater or other resources from the well bore. The Nevada HF rules also require both the disclosure of all chemicals used in an HF treatment and continued monitoring of the well bore for any signs of leaking during the treatment. Proper casing and cementing, along with monitoring, would prevent contamination of groundwater from any HF or other well stimulation treatment.

Exploration and development of a lease may result in long- and short-term alterations to the hydrologic regime depending upon the location and intensity. The U.S. EPA (2016) identifies six oil and gas, HF-related activities most likely to impact waters when management controls are not adequate. These are: 1) water withdrawals which impact groundwater resources; 2) spills of HF fluids, chemicals, or chemical comprising produced water that reach groundwater resources; 3) wells lacking mechanical/infrastructure integrity (e.g., faulty well casings) which allow gases or liquids to migrate into groundwater; 4) injection of hydraulic fracturing fluids into groundwater; 5) allowing inadequately treated hydraulic fracturing waste

water to enter surface water resources; and 6) infiltration of hydraulic fracturing wastewater into groundwater from unlined pits.

Standard BMPs and COAs include the use of lined pits with secondary containment and monitoring features for any flow-back or produced fluids, which are designed to prevent any infiltration/contamination of groundwater or surface water resources. Additionally, though clearing, grading, and soil-stockpiling related to the construction and maintenance of oil and gas production infrastructure could alter short-term overland flow and natural groundwater recharge patterns, these potential impacts can be mitigated in most cases by better location siting and engineering controls and the Controlled Surface Use (CSU) for steep slopes greater than 30%. The BLM may move a proposed well site up to 200 meters at its discretion to mitigate water resource impacts, while the requirements of the Clean Water Act may necessitate relocating the well further. All required state and federal regulations would apply to any future development, and site-specific COAs and mitigation would be an integral part of the approval of any Application for Permit to Drill (APD).

Springs, Seeps, Riparian and Wetland Areas: The consequences of oil and gas exploration or development in wetlands (also playas) and riparian areas are potentially severe, as these environments are extremely sensitive to perturbation. The hydrogeology that results in spring discharge is often unique and complex. In the BMDO, and particularly in and nearby the proposed lease parcels, basement tectonic faults and fractures often control the formation and spatial occurrence of springs, seeps, and spring-fed wetlands and riparian areas (i.e., pronounced link among geology, hydrology, and life). Oil and gas drilling and production could disrupt such linked systems, though geologic, stratigraphic, structural, hydrologic, and geophysical studies can minimize such minimal potential.

The predicted surface disturbance of oil and gas exploration and production, although minor in area, could disproportionately impact the spring/seep/wetlands/riparian ecosystems. Examples include: road building which can redirect water flows and thus result in loss or diversion of water or instream flow, contaminants from any accidental spillage that can easily transition into solution and spread throughout the system, and enhanced turbidity and dissolved oxygen content that can harm microbial life.

The BLM Nevada Standard Stipulations (NV-B-00A-LN), and in particular, Water Resources stipulation (NV-B-10-B-CSU) has been applied to all or portions of the twelve proposed lease parcels (Appendix B). This stipulation employs Controlled Surface Use (CSU) restrictions with measures designed to protect water resources and prevent erosion by using avoidance buffers, engineering controls, and mitigation for these resources wherever they may occur within a parcel. Proper application of the stipulation will protect water resources from unnecessary or undue degradation. It is applied to the $\frac{1}{4}$ $\frac{1}{4}$ sections that encompass the target resource to ensure even the smallest area of surface water resources would be protected while maximizing the area available for lease. The proposed combination of avoidance buffers, engineering controls and mitigation requirements, along with the additional project and site-specific analysis and Conditions of Approval at the exploration and development stage, will meet the requirements of Executive Order 11988, Executive Order 11990, The Safe Drinking Water Act, and The Clean Water Act of 1972, and provide sufficient protection for water resources on the parcels.

State Appropriate Water Rights: According to NDWR, about 101.0%, 87.2%, and 43.3% of the perennial groundwater yield of Little Smoky Valley (Northern Part), Big Smoky Valley (Northern Part), and Railroad Valley (Northern Part), respectively, is appropriated. Since groundwater appropriation levels are below or nearly at the perennial yield, effects to groundwater are not anticipated.

No Action Alternative

The No Action Alternative would create no additional impacts to surface and groundwater resources in the analysis area outside that occurring under current management. Activities on areas adjacent to the

proposed lease parcels would remain ongoing as permitted on surrounding federal, state, and private lands.

Cumulative Effects

Cumulative effects of the Proposed Action, when combined with other current and potential future area activities, could result in increased potential for impacts to surface water and groundwater quality and quantity. Mining, oil and gas exploration and production, geothermal resource development, grazing, land use authorizations including agriculture, and recreation activities could affect water quality in areas of accumulation of surface water runoff. Potential impacts to groundwater temperature and quantity will be avoided or minimized through the use of BMPs for well construction and through implementation of Water Monitoring Plans. Drilling and well construction will be conducted in accordance with state and federal permit requirements. Percolation of geothermal fluids from well testing could have a temporary local impact on groundwater quality and water levels but would be minimized through the use of BMPs (i.e., bentonite clay lining of surface impoundments). Potential impacts to downgradient surface water would be temporary and local, and avoided or minimized through the use of stipulation NV-B-10-B-CSU.

3.5.6 Vegetation and Special Status Plant Species

Affected Environment

Vegetation in the Analysis Area provides forage and cover for wildlife and livestock. It also provides ground cover and root mass to stabilize soils and aids in infiltration of water into the ground. The type of vegetation in a particular area depends largely on soil types and average precipitation. The Natural Resource Conservation Service completed soil surveys and has developed ecological site descriptions from the information collected. Each ecological site description provides detailed information regarding vegetative communities and precipitation zones and is used for evaluating land-use potential, potential plant communities and developing reclamation and rehabilitation plans. Vegetative communities in the Analysis Area include Saline Meadows, Saline Bottoms, Sodic Terraces, and Playas. These vegetative communities, as well as BMD Endangered and Threatened or Special Status Species (SSS) plants occurring in BMD, are listed in Appendix G.

Several Special Status Plant Species have occurrences within the general area of the proposed action, these include Current Milkvetch (*Astragalus uncialis*) and Railroad Valley globemallow (*Sphaeralcea caespitosa* var. *williamsiae*); however, Calloway Milkvetch (*Astragalus callithrix*) and Eastwood milkweed (*Asclepias eastwoodiana*) have potential to occur.

Forestry products within the Analysis Area includes fuelwood, native seed for collection, desert specific plants, pine nuts, and woody biomass. Forestry ecological site descriptions provide detailed information on available forestry products and native vegetation that could be utilized for seed collection permits within the area.

The disturbance associated with oil and gas exploration and production would add to existing oil and gas development and other overall surface disturbance, including grazing, recreation, mineral exploration, range improvement projects, land development and other projects that use the land. Creating new roads, constructing drill pads, and developing wells and mines removes available vegetation and increases the susceptibility of soil to wind and water erosion, soil compaction and invasion by invasive species, and disturbs microbiotic crusts and topsoil.

Environmental Effects of the Proposed Action

There could be effects to vegetation and special status plant species from future projects on any leased parcels. This includes effects to availability of forestry products within the area due to changes in vegetation community composition. It is anticipated that most of the exploration is likely to occur in Saline Meadows, Saline Bottoms, Sodic Terraces, and Playas. Removal and crushing of vegetation would

increase the amount of bare ground, thus increasing wind and water erosion; and increase the potential for invasion by nonnative and noxious species. Considering the amount of disturbance anticipated in the RFD scenario, the effect on vegetation is expected to be comparatively minor when compared to the areas offered for lease (approximately 4,538 acres), and temporary because most of the disturbance (roads and pads) would be reclaimed. Impacts would be considered under additional site-specific analysis when an action is proposed and specifics are known, like location, well depth, water consumption needs, and area of disturbance. Special status plant surveys would be conducted as needed at that time. Through this process, site-specific preventative measures, such as weed prevention, and BMPs, such as cleaning vehicles before and after entering the work area, would be attached as COAs for each proposed activity. Impacts to most vegetation communities are expected to be relatively minor, short term, and localized.

Oil and gas development could potentially affect the quality and quantity of water in parcels where important wetland, springs, and playas occur. Riparian vegetation communities are fragile environments that could be affected by disturbances to the timing and amount of water capture, water storage, and water release. If water resources were affected in these parcels, despite mitigation measures and BMPs, it could create changes in interspecies competition and potentially decrease biodiversity in riparian areas. There is a potential for more drought tolerant species and annual invasive species to outcompete native riparian species for limited nutrients and water. However, the Water Resources stipulation provides protection for riparian-wetland vegetation because it requires avoidance, minimization or mitigation within 500 feet of wetland/riparian areas (see Water Resources section above).

No Action Alternative

The No Action Alternative would create no additional impacts to vegetation or special status plant resources in the analysis area. Activities on areas adjacent to the proposed parcels would remain on-going as permitted on surrounding federal, state, and private lands.

Cumulative Effects

The disturbance associated with oil and gas exploration and production would add to the disturbances from mining exploration, mine development, grazing management, wildfires, fire rehabilitation and range improvement projects and previous geothermal exploration. Creating new roads, constructing drill pads and developing wells removes available vegetation and increases the susceptibility of soil to wind and water erosion, soil compaction and invasion by invasive or non-native species, and disturbs microbiotic crusts and topsoil. However, the cumulative impacts of oil and gas exploration and development on vegetation and special status plants are generally expected to be minimal due to the relatively small area of disturbance in the RFD timeframe, concurrent reclamation, and the development of site-specific mitigation and BMPs. Vegetation near water sources are protected by the standard lease notice and NV-B-11-C-CSU, while NV-B-11-A-CSU and NV-B-11-C-CSU, notify the lessee of steep slopes that may require engineering controls.

3.5.7 Noxious Weeds and Invasive, Non-Native Species

Affected Environment

The BLM defines noxious weeds, invasive plants, and weeds with different, interrelated definitions.

Invasive plant: a plant that is not part of (if exotic) or a minor component of (if native) the original plant community or communities and has the potential to become a dominate or co-dominate species on the site if future establishment and growth are not actively controlled by management interventions; or a plant that is classified as exotic or noxious under state or federal law. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants.

Noxious weed: a plant designated by federal or state laws as generally possessing one of more of the following characteristics: aggressive and difficult to manage; parasitic; a carrier or host of serious insect

of disease; or nonnative, new or not common to the U.S. The BLM Battle Mountain District recognizes the current noxious weed list designated by the State of Nevada Department of Agriculture (NDA) statute, found in Nevada Administrative Code (NAC) 555.010.

Weed: any plant that interferes with management objectives for a given area of land at a given point in time.

The BLM's policy relating to the management and coordination of these species is set forth in the BLM Manual 9015 – Integrated Weed Management. The BLM's primary focus is providing adequate capability to detect and treat smaller weed infestations before they have a chance to spread. Noxious weed control is based on a program of prevention, early detection, and rapid response. In addition to BLM's policy for weed management, some counties, e.g. Eureka County, has a Weed Control District ([Weed Control | Eureka County \(eurekacountynev.gov\)](#)) that defines management strategies that are observed and followed in that district/county.

Noxious weeds and invasive exotic plants are highly competitive and aggressive, and spread easily. They typically establish and infest disturbed sites, along roadsides and waterways. Invasive exotic and noxious plants are commonly found in Nevada in areas where there are seeps and springs or year-round water; regardless of whether a site is heavily disturbed, readily available water will increase the likelihood of all plant life including weeds. Wind, water, animals, vehicles/equipment, and humans spread invasive, exotic, and noxious weeds. Movement of plants from one site to another is greatly increased by introducing humans and equipment to an area. Changes in plant community composition from native species to non-native species can change fire regimes, negatively affect habitat quality, biodiversity, and ecosystem structure and function. There are known infestations of noxious and invasive exotic plants within the analysis area, for example, the sunflower and mustard family of weeds are of concern in Eureka County, these include thistle and Knapweed. Invasive non-native species also include animals; however, there are no records of invasive non-native animal species in or near the analysis area.

Environmental Effects of the Proposed Action

Offering, selling, and issuing federal oil and gas leases would not produce any effect on noxious weeds. However, future ground disturbing activities on any leased parcels could have effects on noxious weeds, and effects are determined using the Reasonably Foreseeable Development scenario. The impact that may occur would be an increase of movement of humans and vehicles to, from, and around the proposed parcels, which could slightly expand any disturbed areas within the sites and assist with the movement of noxious and invasive exotic seeds and other plant matter both within the sites and from the sites to other areas, or vice versa. Wind, water, recreation vehicles, livestock and wildlife would also assist with the distribution of weed seed into the newly disturbed areas.

Parcels with extensive seeps, springs, and wetland-riparian areas – where weeds are particularly likely to become established – would be protected by the Water Resources CSU stipulation, effective immediately upon lease sale. The stipulation calls for avoiding impacts to the target resources, including an appropriate buffer (500 feet for water sources and riparian areas). Application of this stipulation would prevent disturbance to the soils and plant communities that could otherwise promote the spread of weeds in these areas, as described above.

If parcels were developed in the future, additional site-specific mitigation measures, BMPs, and COAs would be implemented to reduce impacts. These would include, but not be limited to, washing equipment at washing stations before bringing it to the project area, and after use; using certified weed-free seed to stabilize any topsoil stockpiles and for interim and final reclamation; and monitoring and treatment programs to detect and halt the spread of any invasive weed species.

No Action Alternative

Under the No Action Alternative, the parcel(s) would not be leased, and no new oil and gas development would occur on the subject lease parcels; therefore, no new noxious weeds or invasive, non-native species could occur on those lands except through transmission from other nearby or adjacent activities to the proposed parcels from on-going or future permitted activities on surrounding federal, state, and private lands.

Cumulative Effects

Potential effects of leasing the parcels would increase surface-disturbing activities that remove vegetation, compact soil, increase erosion and sediment yield, may result in fragmented native plant communities and increase competition from noxious weeds, invasive and non-native species. The disturbance associated with oil and gas exploration and production would add to the disturbances from mining exploration, mine development, grazing management, wildfires, fire rehabilitation, range improvement projects, and past geothermal exploration; disturbed areas would be more susceptible to invasion by invasive species, as described above. However, the cumulative impacts of oil and gas exploration and development are expected to be minimal in most areas due to the relatively small area of disturbance in the RFD timeframe, concurrent reclamation, and the development of site-specific mitigation and BMPs, likewise noxious weed treatments are very small in size in comparison to parcel acreages. The BLM Standard Lease Notices are applied to all parcels to reduce cumulative effects to noxious weeds and invasive species in riparian and wetlands vegetation communities.

3.5.8 Wildlife Resources

Affected Environment

Several wildlife species are likely to occupy the Analysis Area. Parcels with water resources (e.g., streams, springs, seeps, and wet meadows) are likely to support a higher density of wildlife, including endemic aquatic and amphibious species. Other important wildlife habitat types include big sagebrush (mountain and Wyoming big sagebrush), low sagebrush, pinyon-juniper woodlands, and salt desert scrub vegetation. The parcels include seasonally flooded playas; the Great Basin region hosts several rare invertebrate species that occur nowhere else but in this otherwise inhospitable environment. Playas often have the only water available in the desert; pronghorn and other animals may gather there to drink. This section discusses select wildlife species or taxa (groups of species) that are known or likely to occur in the Analysis Area and for which federal law or BLM policy and guidance directs management actions, and includes preliminary scoping input from NDOW and USFWS for this EA. See Appendix G for an explanation and current list of Nevada BLM Sensitive species in BMD.

Fish and aquatic invertebrates generally occupy limited, isolated habitats in Nevada. BLM, NDOW and USFWS biologists identified the following species of conservation concern that are known to, or may, occupy habitat in or near proposed parcels. Several proposed lease parcels are located adjacent to or overlap water resources or wetland areas with significant visible riparian vegetation suggesting surface water flow exists. These parcels are located near these sensitive species' known ranges or habitats, and some parcels may contain unidentified potential habitat.

- Lockes pyrg – (*Pyrgulopsis lockensis*) The Lockes pyrg was petitioned for listing under the Endangered Species Act (ESA) previously; however, the FWS found that the petition did not present substantial information; therefore, the FWS did not evaluate this species for listing under the ESA.
- Railroad Valley tui chub (*Siphaletes bicolor ssp-7*) a BLM and Nevada State sensitive species, occurs within Railroad Valley.
- Railroad Valley springfish (*Crenichthys nevadae*) The Railroad Valley springfish is federally listed as a threatened species under the ESA which occurs within Railroad Valley. Critical habitat

is adjacent to proposed parcel 6968. Any negative impact to the water source on which it depends would be detrimental.

- Lahontan cutthroat trout (*Oncorhynchus clarkia henshawi*) Lahontan cutthroat trout (LCT) is federally listed as threatened species under the ESA that may occur within the project areas in Eureka, Lander, & Nye counties.

Amphibians: The Analysis Area is within the range of two BLM Sensitive amphibians: western toad and northern leopard frog. These amphibians are dependent on the water sources that are found within their areas of distribution and any negative effects to these water sources would be detrimental to their populations. According to NDOW the current range of this species is severely restricted, suggesting its populations are especially vulnerable to environmental changes.

- The Railroad Valley toad (*Bufo nevadensis*) a newly described species, occurs at the Lockes Ranch complex. This amphibian is dependent on the water source within its area of distribution. Any negative impact to the water source on which it depends would be detrimental.

Big Game: The analysis area and all parcels overlap pronghorn (*Antilocapra americana*) year-round habitat (Appendix D). No crucial pronghorn winter habitat intersects proposed parcels, but pronghorn are widely distributed across the Analysis Area; fawning can occur anywhere within their distribution depending on yearly habitat conditions, including playas when forage, water or cover is available. Within the analysis area mule deer (*Odocoileus hemionus*) may occur use a variety of vegetation types and habitats seasonally for forage, thermal cover, and escape cover; riparian areas, meadows and aspen stands are important fawn-rearing areas. No crucial winter or winter habitat for mule deer intersects with any proposed parcels.

Other mammal species of management concern include several BLM Sensitive species which may be found in habitats that are widespread in the Analysis Area.

- **Dark and pale kangaroo mouse** (*Microdipodops megacephalus* ssp., *Microdipodops pallidus*) are found in shadscale scrub, sagebrush scrub, and alkali sink plant communities; the former prefers loose sand and gravel, while the latter are nearly restricted to fine sands.
- **Bats** many species of which are BLM Sensitive species, inhabit or use many habitat niches including caves, abandoned mines, cliffs, springs, riparian, and desert shrub.
- **Pygmy Rabbit** (*Brachylagus idahoensis*) are typically found in areas of tall, dense sagebrush (*Artemisia* spp.) cover, and are highly dependent on sagebrush to provide both food and shelter throughout the year. Their diet in the winter consists of up to 99 percent sagebrush. Pygmy rabbit burrows are typically found in relatively deep, loose soils of wind-borne or water-born origin. They occasionally make use of burrows abandoned by other species and as a result, may occur in areas of shallower or more compact soils that support sufficient shrub cover.

Migratory Birds: A wide variety of bird species protected by the MBTA are found throughout all habitat types in the Analysis Area; see Appendix F for a discussion of major avian communities. Riparian vegetation associated with perennial streams, seeps and springs is particularly important for a diverse migratory bird community. The Analysis Area provides important wetland habitat for waterfowl and shorebird species. Playas, if consistently flooded during the breeding season, may provide breeding habitat for the sensitive western snowy plover (*Charadrius nivosus*); and pooled waters from occasional flooding could provide feeding and stopover habitat for migrating shorebirds. The Yellow-billed Cuckoo (*Coccyzus americanus*) was recently documented in the Lockes area. The western distinct population segment of the yellow-billed cuckoo is listed as threatened under the ESA and is state protected and further classified as sensitive. See the standard lease notice NV-B-00-A-LN, which apply to all parcels and lands and represent standard Best Management Practices for ensuring compliance with the MBTA.

Raptors: Several raptor species are widespread. Golden eagles, prairie falcon, ferruginous hawk, red-tailed hawk, and burrowing owl are among the BLM Sensitive raptor species known to forage in the Analysis Area on a year-round or seasonal basis. All native North American birds of prey are strictly protected. Mountain ranges in or adjacent to the Analysis Area include important raptor habitats. In the BMD, raptor surveys and presence of raptor nests are further scrutinized at the project specific level.

Sage-grouse: The greater sage-grouse (GRSG) is a sagebrush-obligate species. They are dependent on sagebrush habitat for lekking, nesting, brood rearing, and wintering (feeding almost exclusively on sagebrush leaves during the winter). GRSG are known to occur in foothills, plains, and mountain slopes with nearby sagebrush meadows. Dense sagebrush overstory and an herbaceous understory of grasses are important to provide shade and security. Both new herbaceous growth and residual cover are important in the understory. Sage-grouse have specific habitat requirements for carrying out each of their life cycle functions (e.g., courtship and mating on lek habitat, nesting habitat, brood-rearing habitat, and wintering habitat). Each of these habitat types can be widely separated geographically, hence having corridors between habitats is important. Early spring breeding sites called “leks” are usually situated on ridge tops or grassy areas surrounded by a substantial brush and herbaceous components. Leks have less herbaceous and shrub cover than surrounding areas. In early spring, males gather on leks where they strut to attract females. In the Battle Mountain District, greater sage-grouse occur in Eureka, Lander, northern Nye, and west White Pine Counties, in foothills, plains and mountain slopes where sagebrush and meadows are in close proximity. Habitats used by sage-grouse often vary by season (breeding, nesting, early and late brood rearing, and wintering), but some habitats may be used year-round depending on the area. Maps showing greater sage-grouse habitat determinations can be found in Appendix D.

The Analysis Area includes 9 parcels which are located within designated BLM Habitat Management Areas (General or Other) for greater sage-grouse. Parcels 1994, 2095, 2097, and 2100 contain General Habitat Management in at least a quarter-quarter of a section as mapped under the 2022 Plan Maintenance to the 2015 GRSG Plan Amendment, as described under Regulatory Framework above; see Stipulation NV-B-16-B-NSO for the intersection of proposed parcels within GHMA and all greater sage-grouse habitats. Available spatial data from NDOW indicates that brood rearing, summer, and winter habitat may occur within 1994, 2100, 2095, and 2097 parcels within overlapping habitat management areas. Applicable TL and NSO stipulations have been applied using applicable maps from the 2022 Plan Maintenance to the 2015 Nevada and Northeastern California Greater Sage-grouse ROD and ARMPA.

In 2019, sage-grouse population and habitat trends within PMUs were evaluated for triggers by a statewide technical team using collected data and the U.S. Geological Survey modeling Targeted Annual Warning System (TAWS). A stakeholder driven process identified the casual factor of each population and habitat trigger reached within each PMU and adaptive management recommendations were developed. The results of this process were reported by the State of Nevada Sagebrush Ecosystem Program, in the report, *Fall 2019 Adaptive Management Trigger Summary*. In 2020, a supplemental summary was developed after additional triggers were reached. These triggers are used to prioritize funding for restoration and implementing management actions as stated in Appendix J of the 2015 GRSG Plan Amendment (BLM, 2015).

Parcel 1994 has hit three consecutive soft triggers as described under the 2015 ARMPA and USGS Targeted Annual Warning System (TAWS) resulting in a hard trigger. Parcel 2100 has hit a hard trigger as described under the 2015 ARMPA and USGS TAWS. Since a hard trigger has been reached in parcels 1994 and 2100 more restrictive allocations (stipulations) and management actions were implemented in conformity with the adaptive management trigger responses detailed in the 2015 GRSG Plan Amendment, Appendix J, Tables J-1 and J-2 (BLM, 1994). NSO stipulations with limited exceptions (NV-B-16-B-NSO) were applied in GHMA based on the adaptive management trigger responses.

The 2015 ROD/ARMPA specifies that mineral resource developments must adhere to the management directive (MD) mineral resources and fluid minerals (MR), and MR 4a. If leased, developments would require compliance with state regulation under State of Nevada EO 2018-32, which requires coordination with both the sagebrush ecosystem technical team (SETT) and NDOW, and the use of the mitigation hierarchy and the State's mitigation policies and programs.

Environmental Effects of the Proposed Action

Offering, selling, and issuing federal oil and gas leases would not produce any effect on wildlife. However, future ground disturbing activities on any leased parcels could have effects on wildlife resources. It is not possible to know the specific acres and habitat that might be disrupted, and the BLM would not receive any applications for exploration or development until after the lease sale. Additional resource mitigation measures and BMPs would be included in the proposal or attached as COAs for each proposed activity, which would be analyzed under project specific NEPA analysis including consultation with NDOW and USFWS as needed.

The Headquarters Standard Lease Notice, HQ-TES-1, attached to all parcels, alert prospective lessees that the parcel "may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species" and summarizes steps that may be required to address them. The BLM Standard Lease Notice, NV-B-00-A-LN, outlines requirements to protect migratory birds under the MBTA. Bald and Golden eagles are further protected by the BGEPA, and project activity would be restricted within one mile of active nests. Stipulations are used to notify lessees of potential conflicts with wildlife that could occur during future projects, providing direction that must be followed in the specified habitat.

The Department of Interior (DOI) is tasked with avoiding development in crucial winter range or migration corridors; minimizing development that would fragment winter range and primary migration corridors; limiting disturbance of big game on winter range; and utilizing other proven actions necessary to conserve and/or restore the vital big game winter range and migration corridors across the West (SO 3362 and NV-IM-2021-022). These conservation goals would be considered during future NEPA analysis of projects.

Parcels that have seasonal habitats, as identified by NDOW's geospatial data, would be addressed by timing limitation (TL) stipulations, restricting use during the critical seasons to protect populations from disturbance (See *Stipulations*). When a proposal for exploration or development is approved, the proponent would be required to plan work to comply with timing limitations. Parcel development that affects crucial habitat, such as parcels within migration or movement corridors adjacent to crucial habitat would be analyzed to minimize fragmentation, and BMPs would be developed to reduce or avoid impacts to these special areas. If, due to unanticipated delays, operations are ongoing when a restricted season begins, the authorized officer would confer with the proponent and a BLM or NDOW wildlife biologist familiar with the area and decide if and how operations may proceed.

Eight lease parcels, 2102, 2104, 2106, 2107, 2112, 6968, 7030, and 7031, are located outside designated Greater Sage-grouse (GRSG) Priority and General Habitat Management Areas (PHMA & GHMA). However, future exploration or development proposals that fall within 6 kilometers of GRSG habitat are required to consult with the State of Nevada Sagebrush Ecosystem Technical Team (see Appendix B, NV-S-16-Z-LN).

In addition to TL stipulations for wildlife, the Water Resources CSU stipulation is attached to parcels that intersect perennial water, springs, wetland or riparian areas, playas, floodplain, or wells. The Water Resources stipulation notifies the lessee of water resources on the parcel. The NSO stipulation has been applied to all parcels that overlap with the WMA. Aquatic invertebrates and amphibians of conservation

concern whose presence cannot be confirmed due to incomplete survey data will be identified and further protected during future parcel disturbance proposals and NEPA analysis. Stipulations cannot be attached to a parcel to protect resources that are off-parcel; however, off-parcel resources, such as aquatic and amphibious species would be identified during project specific site inspections, NDOW and USFWS would be consulted, and potential effects would be identified and mitigated or avoided at that time.

In other habitats, generally mobile animals would avoid and move away from the project-associated noise and activities; some mortality could occur among small animals unable or less likely to move away; and there would be some loss of habitat.

Based on the RFD scenario, oil and gas exploration and production activities would continue to be minimal in the Analysis Area. Artificial lighting from drilling rigs and infrastructure has the potential to affect wildlife such as insectivorous bats and insects. Guidelines for lighting intensity and orientation would be recommended at the time of any project proposal to avoid, minimize, and mitigate such impacts. Exploration activities are temporary in nature, but some wildlife could be displaced. The conclusion of project activities, including reclamation and restoration of native vegetation, would make those areas available to wildlife.

Based on the available resource protection measures in place, potential future exploration or development on leased parcels should not have any long-term or substantial effects to wildlife resources.

No Action Alternative

The No Action Alternative would create no additional impacts to wildlife resources in the analysis area. Activities on areas adjacent to the proposed parcels would remain on-going as permitted on surrounding federal, state, and private lands.

Cumulative Effects

Cumulative effects from oil and gas exploration and production activities would add to the impacts of other past and present actions and RFFAs that impact habitat or displace wildlife. In upland habitats, the cumulative impact to wildlife and associated wildlife resources from oil and gas activities would generally be expected to be short term and minimal due to the relatively small area of disturbance in the RFD scenario timeframe, combined with concurrent reclamation and development of site-specific mitigation and BMPs, the Proposed Action is not expected to substantially contribute to cumulative effects to wildlife.

3.5.9 Grazing Management

Livestock production is a major industry within the BMD. The Range Program permits and manages public land grazing on 93 allotments for 95 permittees and approximately 377,810 Animal Unit Months (AUMs). An AUM is the amount of forage necessary for the sustenance of one cow or its equivalent for a period of one month. Most grazing allotments are comprised of both public and private lands; however, the majority of the allotments are dominated by public lands. Grazing permits are issued to qualified individuals or entities, and specify livestock numbers, season of use, kind of livestock and number of AUMs allowed for use. Other terms and conditions may be added to grazing permits for the orderly management of the permit and/or the livestock within the allotment(s). Each allotment may have one or multiple permittees. Range improvement projects on the allotments may include fences, cattle guards, pipelines, seedings, vegetation manipulation projects, troughs, and wells.

Affected Environment

Five grazing allotments include all or portions of the parcels proposed for leasing (Appendix D). Table 17 shows grazing allotments within the Analysis Area, the public acres within the allotment, the number of acres of offered lease parcels within each allotment, the number of authorizations (permittees) within each

allotment, the kind of livestock authorized, and active and suspended AUMs. Boundary grazing allotments may be managed by the adjacent District.

Table 17. Grazing allotments with proposed lease parcels for March 2025 lease sale.

Allotment Name	Allotment Public Acres	Approximate Lease Parcel Acres	Number of Authorizations	Kind	AUMs	Suspended AUMs
Butterfield	118,879	2,458	1	Cattle	4,776	470
Sand Springs	203,868	4	2	Cattle	5,727	0
				Sheep	2116	0
Kingston	78,810	16,285	2	Cattle	2,720	6,742
Fish Creek Ranch	289,483	1,131	3	Cattle	4,013	32,000
				Sheep	802	0
Wildcat Canyon	64,976	3,429	1	Cattle	2,677	0

Environmental Effects of the Proposed Action

Potential future actions on leased parcels under the RFD scenario would decrease the public land acreage available for livestock grazing minimally, with potential to temporarily decrease the active AUMs in the affected allotment(s) until reclamation success is achieved. Currently, available forage is allocated on public land at the allotment scale within the District. According to 43 CFR 4110.4-2 (a)(1), where there is a decrease in public land acreage available for livestock grazing within an allotment, grazing permits may be modified as appropriate to reflect the changed area of use. The established stocking rates (AUMs/Acre) will potentially be used to temporarily reduce the appropriate amount of AUMs within allotments based on the number of acres affected by future actions on leased parcels under the RFD scenario. However, the effects are expected to be minor when compared to the total acreage of the grazing allotment(s) that may be affected; and would be temporary in nature, because the majority of the disturbance (roads and pads) would be reclaimed. Impacts to rangeland resources from these activities would be analyzed under an additional project specific EA when an action is proposed and specifics are known, such as location, well depth, water consumption needs, and area of disturbance. Through this process, project-specific mitigation measures and BMPs would be attached as COAs for each proposed activity. Any potential effect to existing range improvements would also be identified and mitigated via the project-specific analysis for any future exploration or development project on leased parcels.

No Action Alternative

The No Action Alternative would create no additional impacts to grazing or range management resources in the analysis area. Activities on areas adjacent to the proposed parcels would remain on-going as permitted on surrounding federal, state, and private lands.

Cumulative Effects

The disturbance associated with oil and gas exploration and production would add to the disturbances from mining activities and off-highway vehicle use. Creating new roads, constructing drill pads and developing wells and mines removes available forage, which could impact ranching operations. However, based on the RFD scenario the cumulative impacts of the proposed action on rangeland resources are expected to be minimal due to the relatively small area of disturbance, concurrent reclamation, and site-specific mitigation.

3.5.10 Cultural Resources

Cultural resources include prehistoric and historic-period resources such as buildings, sites, structures, objects, and districts. Prehistoric cultural resources are associated with the human occupation and use of Nevada before long-term European occupation. Such resources include but are not limited to Native American camp sites, rock art, and trails—some dating to over 12,000 years old. Historic-period cultural resources include both the archaeological- and built-environment, such as buildings and structures, archaeological sites, and historic districts.

Cultural Resources Inventory: The BLM starts every project with a Cultural Resources Inventory Needs Assessment or CRINA. This effort identifies the Area of Potential Effects (APE) from the Proposed Action. The Direct APE and Indirect APE are identified and a records search for Cultural Resources is conducted using *Guidelines and Standards for Archaeological Inventory, Six Edition* (2019). Based on this search, there are thirty-six known cultural resources within the APE. These consist of prehistoric, historic, and multicomponent resources, with varying eligible statuses for the National Register of Historic Places.

Affected Environment

The RFD for oil and gas exploration and development could result in adverse effects to cultural resources. Several ongoing and potential actions in the area, such as mining, mineral and oil and gas exploration, off-highway vehicle use, and livestock grazing, have the potential to cumulatively impact cultural resources. The majority of parcels nominated for this lease sale have not been inventoried for cultural resources; therefore, the types of resources that may be present in any particular area within parcels are unknown. A Class III cultural resources inventory would be required prior to development within parcels. Once an inventory is completed, the geographic and temporal scope for analysis would be defined, followed by an analysis to determine what, if any, impacts there would be to cultural resources resulting from past, present, or reasonably-foreseeable actions within the analysis area. Appropriate mitigation, BMPs, and COAs would be implemented to resolve any adverse effects to historic properties.

Environmental Effects of the Proposed Action

The act of selling oil and gas leases in itself does not have the potential to affect cultural resources, as lease sales do not authorize exploration, development, or production; however, once issued, a lease bestows upon its owner the “right to use so much of the lease lands as is necessary to explore for, drill for, mine, extract, remove and dispose of the leased resource in the leasehold” (43 CFR§ 3101.1-2) subject to specific nondiscretionary statutes and lease stipulations.

Conservatively, based on the RFD scenario, surface disturbance associated with potential oil and gas exploration and production activities could be expected to occur in the BMD. Cultural resources located within the proposed parcels could be affected by oil and gas exploration and development activities (e.g. ground disturbance and facilities construction). As such, identification and evaluation of these resources on a case-by-case basis for compliance with Section 106 of the National Historic Preservation Act (NHPA) would be required prior to project implementation or ground disturbing activities.

The Standard Lease Notice, HQ-CR-1, would be attached to all leases within the BMD to help minimize any potential effects on cultural resources located within the proposed parcels. This Lease Notice informs the lessee that their lease may contain historic properties and/or resources protected under the NHPA, American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, Executive Order 13007, or other statutes and executive orders. It also informs the lessee that the BLM will not approve any ground-disturbing activities that may affect any such properties or resources until it completes its obligations (e.g., State Historic Preservation Officer [SHPO] and tribal consultation) under

applicable requirements of the NHPA and other authorities. The BLM may also require modification to exploration or development proposals to protect such properties or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized, or mitigated.

No Action Alternative

The No Action Alternative would create no additional impacts to cultural resources in the analysis area. Activities on areas adjacent to the proposed parcels would remain on-going as permitted on surrounding federal, state, and private lands.

Cumulative Effects

The Proposed Action does not authorize any ground disturbance and therefore has no direct effect to cultural resources; however, the RFD for oil and gas exploration and development could cumulatively result in adverse effects to cultural resources. Several ongoing and potential actions in the area, such as mining, mineral and geothermal exploration, off-highway vehicle use, and livestock grazing, have the potential to cumulatively impact cultural resources. A cumulative effects study area cannot be defined for cultural resources until the presence of such resources is known. A Class III cultural resources inventory would be required prior to development within parcels. Once an inventory is completed, the geographic and temporal scope for analysis would be defined, followed by an analysis to determine what, if any, impacts there would be to cultural resources resulting from past, present, or reasonably-foreseeable actions within the study area. Appropriate mitigation, BMPs, and COAs would be implemented to resolve any adverse effects to historic properties.

3.5.11 Native American Cultural and Religious Concerns

Affected Environment

The parcels are located among the traditional homelands of the Western Shoshone Tribes. Sites and resources considered sacred or necessary to the continuation of tribal traditions include but are not limited to: prehistoric and historic village sites, pine nut gathering locations, sites of ceremony and prayer, archaeological sites, burial locations, “rock art” sites, medicinal/edible plant gathering locations, areas associated with creation stories, or any other tribally designated Traditional Cultural Property.

Tribal ethnographic resources are associated with the cultural practices, beliefs, and traditional history of a community. In general, ethnographic resources include places in oral histories or traditional places, such as particular rock formations, water sources, or a rock cairn; large areas, such as landscapes and viewsheds; sacred sites and places used for religious practices; social or traditional gathering areas, such as racing grounds; natural resources, such as plant materials or clay deposits used for arts, crafts, or ceremonies; and places and natural resources traditionally used for non-ceremonial uses, such as trails or camping locations. Consultation efforts with tribes may reveal such sites, activities, or resources within the parcels. Consultation with tribes is currently ongoing for this lease sale, and additional consultation will be conducted for each associated project-specific NEPA analysis. Specific information regarding ethnographic resources, as shared by tribal representatives during consultation, is confidential.

The NEPA process does not require a separate analysis of impacts to religion, spirituality, or sacredness. References to such beliefs or practices convey only the terminology used by participants involved in current and historic ethnographic studies and tribal consultation and coordination, and does not reflect any BLM evaluation, conclusion, or determination that something is or is not religious, sacred, or spiritual.

Fluid mineral leasing and exploration may directly affect sites and associated activities of a cultural, traditional and spiritual nature. Potential residual effects of any surface occupancy that results from oil and gas leasing may be cumulative with other past, present, and future actions. Consultation with tribes is key in identifying sites and associated activities of a cultural, traditional, and spiritual nature that may be impacted by project activities. Thus, effects to many cultural, traditional, spiritual sites and associated

activities can be avoided through Native American consultation efforts. In accordance with the National Historic Preservation Act (P.L. 89-665), the National Environmental Policy Act (P.L. 91-190), the Federal Land Policy and Management Act (P. L.94-579), the American Indian Religious Freedom Act (P.L. 95-341), the Native American Graves Protection and Repatriation Act (P.L.101-601) and Executive Order 13007, the BLM must provide affected tribes an opportunity to comment and consult on proposed actions.

The BLM must also attempt to limit, reduce, or possibly eliminate any negative impacts to Native American traditional/cultural/spiritual sites, activities, and resources. Only the potential impacts to tribal resources were analyzed in this EA because it evaluates the leasing of oil and gas parcels, not specific areas of proposed surface disturbance. If, as a result of leasing, a ground disturbing plan to explore or develop is submitted to the BLM, all applicable laws, regulations, directives, SOPs, and stipulations and limitations would apply. The BLM would work with the operator to mitigate effects to traditional/cultural or religious sites from activities associated with any surface occupancy that results from oil and gas leasing. Consequently, the BLM must take steps to identify locations having traditional/cultural or religious values to Native Americans and ensure that its actions do not unduly or unnecessarily burden the pursuit of traditional religion or traditional values. If specific concerns are identified, a thorough cumulative effects analysis would be part of the additional project specific, site-specific NEPA analysis conducted at that time.

Tribal Consultation and Information Sharing: The BLM sent letters to the following tribes on September 18, 2024: the Timbisha Shoshone Tribe, the Duckwater Shoshone Tribe, the Shoshone – Paiute Tribe of the Duck Valley Reservation, the Ely Shoshone Tribe, and the Te-Moak Tribe of Western Shoshone, including the South Fork Band, Elko Band, Wells Band, and Battle Mountain Band to identify areas of concern, mitigation measures, operating procedures or alternatives that may eliminate or reduce impacts to any existing tribal resources. The majority of lands in the parcels have not been analyzed for ethnographic resources or Native American cultural concerns. The BLM BMD has an ongoing invitation for consultation and information sharing with the tribes. Consultation and communication with tribal/band governments has included letters, phone calls, e-mails, and visits with individual tribal/band Environmental Coordinators or other representatives. Consultation and information sharing will continue throughout the life of the project. The BLM will conduct additional Native American consultation and coordination during future, site specific proposals on public lands for these lease parcels and all other leasing activities involving surface disturbance.

Environmental Effects of the Proposed Action

Although the act of issuing oil and gas leases does not directly authorize exploration, development, or production, or any other related ground-disturbing activities, the potential exists for future such activities on leased parcels to affect Native American spiritual, cultural, or traditional sites. Such effects can be difficult to effectively mitigate; however, effects can be minimized and/or mitigated when affected Tribes provide input and actively and fully participate in the decision-making process. The Standard Lease Notice, HQ-CR-1, is attached to all parcels and states that the BLM will not approve any ground-disturbing activities until it conducts its tribal consultation obligations and may require modification to exploration or development proposals or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized, or mitigated. If projects are proposed on any leased parcel in the future, each would be analyzed under project specific NEPA analysis. At that time the BLM would consult with the tribes and site-specific mitigation measures and BMPs would be attached as COAs.

No Action Alternative

The No Action Alternative would create no additional impacts to Native American cultural and religious resources in the analysis area. Activities on areas adjacent to the proposed parcels would remain on-going as permitted on surrounding federal, state, and private lands.

Cumulative Effects

Oil and gas leasing would not have direct effects on sites and associated activities of a cultural, traditional, and spiritual nature. Future projects for oil and gas exploration and development have the potential to affect such sites and activities. Potential residual effects of any surface occupancy that results from oil and gas leasing may be cumulative with other past and present actions and RFFAs. Consultation with tribes is key in identifying sites and associated activities of a cultural, traditional, spiritual nature that may be impacted by project activities. Thus, effects to many cultural, traditional, spiritual sites and associated activities can be avoided through Native American consultation efforts.

In accordance with the National Historic Preservation Act (P.L. 89-665), the National Environmental Policy Act (P.L. 91-190), the Federal Land Policy and Management Act (P. L.94-579), the American Indian Religious Freedom Act (P.L. 95-341), the Native American Graves Protection and Repatriation Act (P.L.101-601) and Executive Order 13007, the BLM must provide affected tribes an opportunity to comment and consult on proposed actions. The BLM must also attempt to limit, reduce, or possibly eliminate any negative impacts to Native American traditional/cultural/spiritual sites, activities, and resources. Only the potential impacts to tribal resources were analyzed in this EA because it evaluates the leasing of oil and gas lease sale parcels, not specific areas of proposed surface disturbance. If, as a result of leasing, a ground disturbing plan to explore or develop is submitted to the BLM, all applicable laws, regulations, directives, SOPs, and stipulations and limitations would apply.

The BLM has initiated consultation with the following federally recognized tribes: the Timbisha Shoshone Tribe, the Yomba Shoshone Tribe, the Duckwater Shoshone Tribe, the Shoshone-Paiute Tribes of the Duck Valley Reservation, the Ely Shoshone Tribe, and the Te-Moak Tribe of Western Shoshone, including the South Fork Band, Elko Band, Wells Band, and Battle Mountain Band to identify areas of concern, as well as the operator, to mitigate effects to traditional/ cultural or religious sites on activities associated with any surface occupancy that results from oil and gas leasing. Consequently, the BLM is taking steps to identify locations having traditional/cultural or religious values to Native Americans and ensure that its actions do not unduly or unnecessarily burden the pursuit of traditional religion or traditional values. If specific concerns are identified, a thorough cumulative effects analysis would be part of the additional project specific NEPA analysis conducted at that time.

3.5.12 Recreation

Affected Environment

The proposed lease parcels mostly fall within dispersed recreation areas subject to public use. Dispersed recreation activities include off-highway vehicle (OHV) use, driving for pleasure, camping, mountain biking, sightseeing, rock collecting, photography, hunting, fishing, recreational shooting, trail running, hiking and bird watching.

Oil and gas exploration and development is the landscape in the Analysis Area. Development may reduce the opportunity to recreate but generally provides roads and access to areas that may not be seen otherwise. The RFD scenario for fluid minerals does not impede recreation opportunities. Increased commercial development could slightly increase the area's population, which would create an increase in numbers of recreationists.

Environmental Effects of the Proposed Action

Future activity on leased parcels could affect recreation resources. During the exploration phase, survey and drilling crews are likely to use available access roads and trails that are also used for dispersed recreation and access to recreation opportunities. Increased truck traffic during construction of access roads and well pads could affect recreation due to increased noise and dust levels and could cause temporary delays or closures on access roads. Construction sites are likely to limit public access, slightly decreasing access to the area for recreation and possibly displacing recreational users. Survey and exploration activities are likely to minimally effect recreation, if at all, due to the short duration, small crew size and temporary nature of the surveys and well drilling, along with the dispersed nature of recreation activities in these areas.

The production stage may include operation and maintenance of the constructed facilities. These activities require a small number of employees who would use access roads in the area but are not likely to limit recreational use of these roads. Oil and gas production facilities are likely to have limited public access; this could slightly decrease access to the area for recreation and possibly displace recreational users. However, improved access to the general area for recreation may be available because of the maintained access road to the production facility. If parcels were developed in the future, mitigation measures and BMPs would be developed and attached as COAs for each proposed activity, through additional project- and site-specific NEPA analysis.

No Action Alternative

The No Action Alternative would create no additional impacts to recreation resources in the analysis area. Activities on areas adjacent to the proposed parcels would remain on-going as permitted on surrounding federal, state, and private lands.

Cumulative Effects

Past and present actions and RFFAs with the greatest potential to affect recreation include oil and gas exploration and development, mineral exploration and mining, and solar and wind power generation projects. Given that many outdoor recreation activities are dependent upon a high quality visual/aesthetic environment, such developments, including fluid mineral development, have the potential to cumulatively lower the quality of recreational experiences in the Analysis Area. A reduction in opportunity for primitive and unconfined recreation could affect visitor use of the area as well as quality of the experience.

Increased commercial development could slightly increase the area's population, which would create an increase in numbers of recreationists. Examples would be visits to WSAs, hunting and OHV use. This could affect wilderness characteristics by reducing opportunity for solitude.

3.5.13 Visual Resources

Affected Environment

BLM Manual Series 8400 outlines the visual resource management (VRM) program. The BLM assigns VRM classes to public lands through the land use planning process, with management direction for each class. Attempts are made to mitigate visual contrasts from surface-disturbing activities regardless of the VRM class. VRM classes are based in part on a Visual Resources Inventory (VRI) which rates existing scenic values. The Tonopah RMP established VRM classes; the Shoshone-Eureka RMP, Mount Lewis Field Office (MLFO) did not. The BMD will establish VRM classes for the MLFO as part of the next RMP revision as priorities dictate. In the interim, visual resources will be managed with best management practices for multiple use. (See Appendix D for maps).

In the Mount Lewis Field Office, Parcels 2095, 2100, 2102, and 2106 are completely within VRI Class II. Parcels 2095, 2097, 2104, 2107, and 2112 are partially within VRI Class II and VRI Class IV. Parcel 1994 is wholly within VRI Class IV.

In the TFO, parcel 6968 is within VRM Class IV. Management direction for these classes is stated in Tonopah RMP Determinations (p. 6), <https://eplanning.blm.gov/eplanning-ui/project/77957/510>.

If or when a project is proposed, effects to visual resources, and measures to minimize them, would be considered as part of the additional project specific environmental analysis. As stated above, a VRM class will be established for each project. Effects would be assessed from key observation points, such as roads, scenic overlooks, or homes. Structures in the foreground distance zone (0-½ mile) often create a contrast that exceeds the VRM class, even when designed to harmonize and blend with the characteristic landscape. Approval by the Area Manager is required on a case-by-case basis to determine whether the structure(s) meet the acceptable VRM class standards and, if not, whether they add acceptable visual variety to the landscape. Dark skies are also taken into consideration as a visual resource. Central Nevada, including the Analysis Area, generally offers outstanding night sky viewing opportunities with frequent clear weather and many areas of little or no light pollution.

Environmental Effects of the Proposed Action

Future effects to visual resources on leased parcels may include, but are not limited to, contrast of line, shape, color, or texture due to roads, drill pads, drill rigs, tank batteries, temporary and long-term facilities and pump jacks; and the effects of nighttime lighting to dark skies. If parcels were developed in the future, site-specific visual resource mitigation measures and BMPs would be developed and attached as COAs for each proposed activity, which would be developed through additional project- and site-specific NEPA analysis. Potential methods to reduce impacts include, but are not limited to:

- designing lighting to reduce the impacts to night skies
- screening any stationary lights and light plants
- directing lighting onto the pertinent site only and away from adjacent areas not in use, with safety and proper lighting of the active work areas being the primary goal
- hooding and shielding lighting fixtures as appropriate
- using topographic features to visually screen facilities
- locating drill sites where they will be least conspicuous (BLM has the discretion to move proposed drill site locations up to 800 meters within the lease boundary)
- reducing the size or changing the configuration of drill pads
- using low profile tanks
- matching colors (approved by BLM VRM specialist) of facilities and equipment to blend in with the surroundings
- planning road alignment to minimize visual contrast
- required reclamation, which may include re-contouring drill pads; reclaiming roads; re-seeding drill sites and roads; and removing equipment and facilities

These methods, along with any others identified via NEPA analysis at the APD stage, generally have the potential to minimize effects to visual resources on public lands to the greatest extent practicable.

No Action Alternative

The No Action Alternative would create no additional impacts to visual resource in the analysis area. Activities on areas adjacent to the proposed parcels would remain on-going as permitted on surrounding federal, state, and private lands.

Cumulative Effects

Past and future oil and gas exploration and development, mineral exploration and mining, gravel pit development and production, wind or solar power construction, communication site construction, and road building have the potential to affect the visual resources present in the area. Oil and gas development is a prominent feature in Railroad Valley. Given that many outdoor recreation activities are dependent upon a high quality visual/aesthetic environment, such developments, including fluid mineral development, have the potential to cumulatively lower the quality of recreational experiences in the Analysis Area.

Increased commercial development and increasing population will affect visual resources. These changes would occur slowly over time and continued oil and gas development would be gradual with limited surface disturbance. Visual resources are mitigated on a case-by-case basis and many of the activities would be temporary, with visual contrasts essentially eliminated when reclamation (re-contouring and revegetation) is completed, also eliminating affects to the appearance of naturalness.

3.5.14 Lands with Wilderness Characteristics

Affected Environment

The BMD completed an inventory for lands with wilderness characteristics in 2017, defined by the Wilderness Act of 1964 as land that “(1) generally appears to have been affected primarily by the forces of nature, with the imprint of man’s work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.” Section 201 of the Federal Land Management Policy Act (FLPMA) requires the BLM to maintain, on a continuing basis, an inventory of all public lands and their resources and other values, which includes wilderness characteristics. It also provides that the preparation and maintenance of the inventory shall not, of itself, change or prevent change of the management or use of public lands. It does not address or affect policy related to Congressionally designated Wilderness or existing Wilderness Study Areas. The Shoshone-Eureka RMP does not address lands with wilderness characteristics. They will be addressed in future RMP amendments. In the interim, the District will manage lands with wilderness characteristics for multiple use.

In accordance with BLM Manual 6310, an inventory identifies any unit of land with at least 5,000 roadless acres or otherwise meeting criterion (3), then determines if that unit meets criteria (1) and (2). Lands meeting all three of these criteria are considered to have wilderness characteristics. There are 3 inventory units in the Analysis Area that were found to have wilderness characteristics intersecting all of the proposed lease parcels. A list of units with wilderness characteristics and parcels intersecting each is shown below and maps can be found in Appendix D.

Table 18. Inventory Units with Wilderness characteristics

Units with Lands Wilderness Characteristics (LWC)	Parcel # that intersects the LWC Unit
NV-060-256, NV-060-255A, NV-040-141	NV-2025-03-1994
NV-060-335A	NV-2025-03-2100
NV-060-335A, NV-060-364A	NV-2025-03-2102
NV-060-335A	NV-2025-03-2106
NV-060-335A, NV-060-374B	NV-2025-03-2112
NV-060-335A	NV-2025-03-2107
NV-060-335A, NV-060-364A	NV-2025-03-7030
NV-060-335A, NV-060-364A	NV-2025-03-7031

NV-060-335A, NV-060-364A	NV-2025-03-2104
NV-060-335A, NV-060-364A	NV-2025-03-2097
NV-060-364A	NV-2025-03-2095

Environmental Effects of the Proposed Action

Future oil and gas exploration and production projects on any leased parcels that intersect inventory units having wilderness characteristics could potentially affect those characteristics for the duration of the project, and such effects would be considered as part of a project-specific NEPA analysis, which will include an updated inventory of wilderness characteristics. While BLM policy and the District’s RMPs do not currently require managing lands so as to maintain wilderness characteristics, standard practices under several other policies would be applied that would tend to reduce these effects, as described below.

If new access roads were not restored to pre-disturbance conditions after a project, they could potentially reduce the size of a roadless area to less than 5,000 acres, in which case the inventory unit would no longer be considered to have wilderness characteristics unless it otherwise meets criterion (3). However, roads would generally be required to be reclaimed and revegetated to pre-disturbance conditions when the project is completed (see Appendix C).

Geophysical exploration could temporarily affect opportunities for solitude, via the presence for a few hours or days of personnel and equipment, and in some cases noise and vibration that may be sensed at a distance. Exploration drilling could affect opportunities for solitude or for primitive and unconfined recreation for the duration of the project, via traffic, noise, dust levels, displacing recreationists and/or limiting access, as described in the Recreation section above. Potential effects discussed in the Visual Resources section above – due to such factors as roads, drill pads, drill rigs, tank batteries, temporary facilities, and impacts of nighttime lighting to dark skies – would affect the appearance of naturalness and would be minimized to some extent by policies also discussed in that section. Exploration projects that do not proceed to development and production end with reclamation (Section 3.1.1), which would return the area to a natural-appearing condition and impacts to solitude and recreation would also cease.

Development and production could produce effects similar to those of exploration drilling but that would be more long-term and could potentially cause an inventory unit to no longer be considered to have wilderness characteristics under criteria (2) and (3) in a subsequent inventory, depending on such factors as the number and placement of wells and long-term facilities in relation to the unit’s size, configuration, and topographic and vegetative screening; and the success of measures taken to minimize effects. An inventory unit can have wilderness characteristics even though every acre within the unit may not meet all the criteria. If wells and facilities are “substantially unnoticeable” in the context of the unit as a whole, and the unit overall still “generally appears” natural, the unit could still meet criterion (1). If “outstanding opportunities” to experience solitude or primitive and unconfined recreation (not necessarily both) still exist within the unit as a whole, it could still meet criterion (3). BLM Manual 6310 provides further information on how these criteria are applied in the wilderness characteristics inventory process.

When production has ceased, final reclamation would be completed and all impacts to wilderness characteristics would cease.

No Action Alternative

The No Action Alternative would create no additional impacts to lands with wilderness characteristics in the analysis area. Activities on areas adjacent to the proposed parcels would remain on-going as permitted on surrounding federal, state, and private lands.

Cumulative Effects

The disturbance associated with oil and gas exploration and development would add to the disturbances from mining exploration, mine development, grazing management, wildfires, fire rehabilitation and range

improvement projects and previous oil and gas and geothermal exploration. Creating new roads, constructing drill pads and developing wells and mines removes available vegetation and increases the susceptibility of soil to wind and water erosion, soil compaction and proliferation of invasive weeds or non-native species. Ultimately, these changes could take many years to tens of years to recover after the project is complete, affecting criteria of wilderness characteristics temporarily or permanently, but can be minimized due to the relatively small area of disturbance in the RFD timeframe, concurrent reclamation, and the development of site-specific mitigation and BMPs. Most of the future activities would be on valley floors. Lands with Wilderness Characteristics are mitigated on a case-by-case basis and many of the activities would be temporary, with visual contrasts essentially eliminated when reclamation (re-contouring and revegetation) is completed, also eliminating impacts to the appearance of naturalness.

3.5.15 Geology and Mineral Resources

Affected Environment

This section discusses extractive mineral uses that may exist in the Analysis Area and be potentially affected by the Proposed Action, with a brief overview of regional geology as background. The Basin and Range province is comprised of north-south trending mountain ranges separated by broad valleys, created through extension of the earth's crust where portions of the crust were faulted and either down thrown (creating basins), or uplifted, creating mountains. The resulting separation and crustal thinning brought magma heat sources close to the surface, leading to volcanic activity, superheated fluid, associated intrusive and igneous activity, and maturation of hydrocarbon sources. This geologic setting has been instrumental in the location of and potential for numerous economic metallic mineral deposits in the Analysis Area, as well as development of economic oil and gas resources.

Nevada is seismically active, with numerous earthquakes each year; most are small with epicenters located several miles below the ground surface. It is unlikely that any of Nevada's oil wells would be affected by minor earthquakes (< 5.5 magnitude) that are often felt but only cause minor damage.

Locatable Minerals have been historically within the Analysis Area include metallic minerals (i.e., gold, silver copper, mercury, zinc, molybdenum, manganese, uranium, tungsten); industrial minerals (limestone, barite, gypsum, diatomaceous earth, sulfur, and fluorspar); and most recently, fluid locatable (lithium). Oil and gas interests may potentially overlap with those of mineral exploration; and mining claims, mining notices, or plans of operation may overlap the parcels, so that coordination with the claimant may be necessary.

Mineral Material Sale of common minerals encompasses petrified wood and common varieties of sand, stone, gravel, pumice, pumicite, cinder, and clay. Less common are sales of topsoil and specialty sand, gravel, or decorative rock. Saleable mineral sites with a priority for use are located along State, County, and BLM managed roads. These types of saleable minerals are distributed throughout Nevada and overlap with oil and gas lease parcels should be expected. Parcel NV-2025-03-1994 overlaps with an existing mineral material community pit, NVN-075659.

Leasable Minerals are those that may be extracted from leases on public lands and are subdivided into solid and fluid leasable mineral groups. Solid minerals include coal, sodium, sulfur, potassium, and phosphate (and under certain conditions, sand, and gravel). Fluid minerals include oil, gas, and geothermal resources.

Oil and Gas parcels on public lands have been available within the District for several decades. The main producing oil fields are located within Railroad Valley and Pine Valley; however, exploration for oil and gas could be expected in Diamond Valley, Garden Valley, Big Smoky Valley, Ione Valley, Fish Creek Valley, Antelope Valley, and Big Sand Springs Valley. Oil and gas in Railroad Valley occur mainly in Miocene and younger age basins formed during the Basin and Range Orogeny. Hydrocarbon traps are

stratigraphic and structural in nature. Most oil and/or gas are trapped in the fractured, Oligocene age volcanic rocks and are believed to be sourced from deeper Cretaceous and early Tertiary marine sediments. Pine Valley oil production comes primarily from Oligocene and Miocene sedimentary and volcanoclastic sedimentary rocks, but rocks as old as the Devonian Telegraph Canyon Formation host oil in the vicinity of the Analysis Area. Natural gas is not produced in commercial quantities in Nevada.

Typically drill sites are chosen following geophysical exploration of subsurface conditions, followed by exploration drilling, or drilling of wildcat wells. Additional drilling occurs when initial exploration has shown the presence of a resource, and placement of new wells is used to further define the extent of that resource. Production occurs if the oil can be transported and sold at a profit. The existing oil field in Railroad Valley uses regional temporary storage facilities and later transport to a refinery for processing.

As of January 20th, 2022, there are 394 authorized oil and gas leases in Nevada (Nevada Division of Minerals (NDOM)). Since 1907, roughly 770 oil and gas wells had been drilled in Nevada. Total oil production from 1955 to 2021 is 54.9 million barrels of oil. Oil production in 2021 in Nevada was 288,342 barrels of oil per year (source: NDOM).

Shale Oil contains significant crude oil and may be used as a source of petroleum. The potential within the Analysis Area is low in the short term and probably low to moderate in the long term. Shale oil production typically requires a very large resource, access to energy, and access to large volumes of water. The Chainman Formation (Mississippian), Vinini Formation (Ordovician), Woodruff Formation (Devonian), Sheep Pass Formation (Eocene), and the Elko Formation (Eocene-Oligocene) are potential sources of shale oil (Anna et al. 2007) within the Analysis Area. The Sheep Pass Formation hosts some oil in the Railroad Valley area. The Elko Formation may occur within the BMD in the lower stratigraphy of Pine Valley, but the bulk of the Elko Formation is northeast of the BMD.

Geothermal – All land within the BMD is open to geothermal leasing and development with the exception of specific closures such as Wilderness Areas, Wilderness Study Areas, community watersheds, critical wildlife habitat areas, and military reservations; 20 percent of the land within the District is potentially valuable for geothermal resources, located mainly in Esmeralda and Lander counties. The 2008 *Geothermal Programmatic Environmental Impact Statement for Geothermal Leasing in the Western U.S.* expedites processing geothermal lease applications. Lease sale parcels that overlap with geothermal leases include: NV-2025-03-2095, NV-2025-03-2097, NV-2025-03-2100, NV-2025-03-2102, NV-2025-03-2104, NV-2025-03-2106, NV-2025-03-2107, NV-2025-03-2112, and NV-2025-03-7031.

Since fluid and solid minerals are non-renewable resources, the combined effects of producing either or both would result in mineral depletion. However, considering the RFD scenario and that site-specific mitigation measures would be required for exploration and development, the Proposed Action's contribution to overall effects would not be substantial.

Environmental Effects of the Proposed Action

If any parcels are leased and developed, design features, project specific mitigation measures, and BMPs would be attached as COAs for each proposed activity, which would be developed through additional site-specific NEPA analysis. The included stipulations offer an advantage to prospective lessees in that they identify important natural resource issues associated with particular parcels – water resources, steep slopes, and deer and pronghorn seasonal habitats – in advance, along with measures to protect them. This would reduce some of the uncertainty of waiting for project-specific NEPA analysis to identify resources of concern and define appropriate conditions of approval.

The potential that oil and gas interests may overlap with other solid or fluid mineral exploration exists. The majority of acres that may be used for oil and gas exploration and production are usually reclaimed

within 5 years. In most instances, oil and gas exploration is a short-term endeavor (1-12 months) and hence would not appreciably affect mineral exploration and development. Agreements between oil and gas and mineral operators could help to mitigate those acres that would be used for oil and gas production on a more long-term basis. Any potential effects to existing mineral estate would be identified and mitigated via the project-specific analysis for any future exploration or development project on leased parcels.

Oil and gas exploration and development activities could require additional gravel pit expansion, but the small requirements for each project would not greatly increase the size or number of gravel pits, nor would it burden the communities that use gravel.

No Action Alternative

The No Action Alternative would create no additional impacts to geology and mineral resource in the analysis area. Activities on areas adjacent to the proposed parcels would remain on-going as permitted on surrounding federal, state, and private lands. New development on existing authorized oil and gas leases not held by production would be subject to additional NEPA analysis at the project proposal stage.

Cumulative Effects

There is little appreciable potential for exploration or development resulting from the Proposed Action to have substantial cumulative impacts, combined with past and present actions and RFFAs, to geology and minerals. Based on the RFD scenario, only a small percentage of acres of constructed roads associated with exploration/development would potentially remain after 10 years. The likelihood of other resources being present at the same location is minor, although not impossible, and methods are in place to co-develop resources. Since fluid and solid minerals are non-renewable resources, the combined effects of producing either or both would result in mineral depletion. However, considering the RFD scenario and that site-specific mitigation measures would be required for exploration and development, the Proposed Action's contribution to cumulative impacts would not be substantial.

3.5.16 Land Use Authorizations

Affected Environment

Revised Statute 2477 (RS 2477) (Section 8 of the Mining Act of 1866) is a federal law that authorized construction of roads across federal public lands. RS 2339 protects the use of water infrastructure used for mining, agriculture, manufacture, and other purposes in place prior to the lands being withdrawn as well. Congress repealed RS 2477 and RS 2339 in 1976 and enacted the Federal Land Policy and Management Act (FLPMA). Section 701 of FLPMA preserved these rights-of-way that existed at the time FLPMA was passed and preserved them for public use. State and counties rely on RS 2477 or RS 2339 to establish ownership that have been used continuously for ten years prior to 1976.

All of the proposed lease parcels are on public lands with federally controlled surface and subsurface mineral estate. One parcel, NV-2025-03-2100 contains a quarter-quarter section on private surface. If a lease cannot be accessed by an existing road, the lease sale parcel would require a right-of-way (ROW) to access it. Lease notice, NV-B-13-A-LN, informs potential lessees of existing land use authorizations that overlap or intersect lease parcels. Some proposed parcels include pre-existing land use authorizations such as grants, leases, permits and withdrawals; and new ones may be authorized prior to any proposals for exploration by a geothermal lessee. In these instances, the holder of land use authorization would have a valid existing right to the authorized use of public lands within the lease.

One solar energy project overlaps oil and gas lease sale parcel NV-2025-03-2107 (see map in Appendix J). The Wildcat Solar project has not been segregated from locatable mineral entry and would not prevent fluid mineral leasing; however, the first party to propose a project would be given preference; though multiple mineral development would be preferred and encouraged.

Appendix J provides a summary of the existing land use authorizations overlapping the proposed lease parcels.

Environmental Consequences of the Proposed Action

By federal law, future activity on leased parcels could impact existing ROWs. FLPMA requires that prior existing rights must be recognized. Any conflicts would be mitigated through agreements between relevant operators, or between the county and operator. If parcels were developed in the future, site-specific mitigation measures and BMPs would be attached as Stipulations for each proposed activity. Applications for new ROWs may be required for roads for geothermal exploration and production activities. These off-lease ROWs would be non-exclusive where possible, that is, could be used by the public for other purposes such as access to public lands. Off-lease uses of RS 2477 access roads could require coordination with the county including maintenance agreements.

No Action Alternative

The No Action Alternative would create no additional impacts to land use authorizations in the analysis area. Activities on areas adjacent to the proposed parcels would remain on-going as permitted on surrounding federal, state, and private lands.

Cumulative Effects

The disturbance associated with oil and gas exploration and production would add to the disturbances from mining activities and off-highway vehicle use. Creating new roads, constructing drill pads and developing wells removes land available for renewable resources such as vegetation, wildlife, grazing, or forage. Based on the RFD scenario the cumulative impacts of the proposed action on land use authorizations are expected to be minimal due to the relatively small area of disturbance, concurrent reclamation, and comingling of resources.

3.5.17 Socioeconomic Values

Affected Environment

The proposed lease parcels are located within Railroad Valley, northeastern Nye County, Fish Creek Valley, eastern Eureka County, and ten parcels are in Big Smoky Valley near the northern Nye/southern Lander County border. The data reported below includes statistics from Nye, Lander, and Eureka counties. Reference community for this analysis was identified as Nevada non-metro counties. These data layers were selected because they are proximal to the project area and contain populations that the project may directly and/or indirectly impact.

Land Ownership

There are 17,850,115 total acres within the study area; within that area is 16,388,415 acres (91.8 percent) of federally owned lands. The BLM manages 11,184,220 acres (62.7 percent) of the study area's total land. There are 1,461,700 acres (8.2 percent) of the study area under private ownership. Tribal lands include 12,877 acres (0.07 percent) of the total study area.

Population Demographics

Population data presented includes data for northern Nye County, NV (compiled from U.S. census tracts Nye County, 9601 and Nye County, 9602), as well as Eureka and Lander Counties. Population data from 2022 (Table 19) was obtained using these sources: U.S. Department of Labor, the Bureau of Labor Statistics, local area unemployment statistics, the U.S. Department of Commerce, and the Census Bureau, as compiled by the Headwaters Economics Socioeconomic Profiles Tool developed for the BLM.

Table 19. Population density by county.

County	Area, mile ²	Population, 2022	Population density per mile ²
Northern Nye ¹	~11,700	4,759	0.41
Lander	5,651	5,728	1.01
Eureka	4,180	1,622	0.38
(Nevada Non-metro)	97,687	289,873	28.11

¹ Census tract 9601 and 9602 combined, area estimated using GIS.

Table 20. Poverty Rates (and percent of county population)

Population*	Northern Nye Co., NV	Lander Co., NV	Eureka Co., NV	Reference Area NV Non-metro
Total	4,528	5,679	1,616	282,390
People in Poverty	647 (14.3%)	611 (10.8%)	285 (17.6%)	5,362 (11.1%)

* = Total population for whom poverty status is determined (may be different that previously reported population totals).

Environmental Consequences of Proposed Action

Leasing, exploration, and development of oil and gas leases generate revenue to Federal, state, and local governments. The State of Nevada retains 49 percent of the proceeds. Revenues generated from competitive oil and gas lease sales in the state of Nevada for fiscal year 2023 totaled \$10,595; statewide oil and gas (including pre-production) revenues from 2023 totaled \$2,142,967 million (ONRR, 2024). Subsequent oil and gas exploration, development and production could affect the local economy in terms of additional jobs, income and tax revenues. Oil and gas companies typically provide in-house scientists and technicians for most pre-drilling exploration work. Subsequent oil and gas exploration and development activities could include road and drill pad construction, which could be contracted to local contractors. Wells would typically be drilled over a period of time and not at the same time. Since these parcels fall in remote regions of Nevada, it is unlikely that a large number of jobs would be created; that is, there are no communities to support work crews. Exploration companies developing oil and gas leases often bring workers to the site, where they live in company or personally owned mobile housing units until the work is complete. The local communities of Eureka, Tonopah, or Ely could see some benefit during construction. These could include consumables such as fuel or food; additionally, waste storage and pickup services may be retained at these locations.

During development and production phases, the potential for local socioeconomic impacts could increase. Local community services such as emergency response, health care, housing, and food supplies may be burdened. Many rural Nevada communities do not have the flexibility to increase housing or food supplies. New or additional roads and drill pads could be needed, construction personnel would come from local contractors. Local businesses may realize increased revenue from the purchase of supplies, meals, rooms, etc. Local trucking and delivery companies may also benefit economically by transporting supplies, building materials and industrial products, and consumables. The additional economic activity and employment results in a trickle-down effect, supporting employment and economic activity in other sectors of the economy including housing, retail, services, and government.

Positive indirect impacts to socioeconomics would likely be minor, given the RFD scenario (Appendix C); however, bonus bids (the amount paid at time of auction), annual rent fees (for 10 years regardless of activity on a leased parcel), and royalties (if and when production occurs) may provide substantial income

to county governments for schools and other expenditures. The potential for adverse effects to the human environment, including human health hazards, is low (see effects analyses for air quality, section 3.5.1; water quality, 3.5.5; and hazardous and solid waste, 3.5.19). The Proposed Action would not induce substantial growth or concentration of population, displace a large number of people, cause a substantial reduction in employment, reduce wage and salary earnings, cause a substantial net increase in county expenditures, or create a substantial demand for public services.

For any future proposed project on any parcel that is leased, additional project specific NEPA analysis would be required, including a thorough examination of socioeconomics and environmental justice. The required NEPA analysis would address all aspects of exploration, development and production, including connected actions such as transportation of any oil or gas produced.

No Action Alternative

The No Action Alternative would not result in additional positive or negative effects to socioeconomic values in the analysis area. Activities on areas adjacent to the proposed parcels would remain on-going as permitted on surrounding federal, state, and private lands.

Cumulative Effects

As described above, it is expected that the socioeconomic effects of the Proposed Action would be minor and beneficial. The same would be expected for cumulative effects. Specific information regarding the timing, duration, and level of employment is not available for other RFFAs that may occur within the Analysis Area, precluding a comprehensive analysis of potential cumulative socioeconomic impacts. Additional project-specific analysis would be required for any future exploration or development project, including socioeconomics and environmental justice effects.

3.5.18 Environmental Justice

Affected Environment

Federal analysis of environmental justice was initiated with President Clinton's February 11, 1994, Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," and an accompanying Presidential memorandum. Executive Order 12898 requires that each federal agency consider environmental justice to be part of its mission. Its intent is to promote fair treatment of people of all races and income levels, so no person or group of people bears a disproportionate share of the negative effects from the country's domestic and foreign programs. Specific to the NEPA process, the EO requires that proposed projects be evaluated for disproportionate and impacts of project actions on environmental justice communities.

For this project the study area has been identified as selected census block groups (BG) in Eureka, Lander, and Nye counties (Table 21, Appendix E Figure 1). This study area was selected as it contains and is proximal to communities with high potential for project impacts. The population in the study area totals 8,648. The reference area is Nevada non-metro counties. The parcel locations are BG 320110001001 (lease parcels 2095, 2097, 2100, 2102, 2104, 2106, 2107, 2112, 7030, and 7031), BG 320239601002 (lease parcel 6968 and a portion of 2097) and 320239601002 (lease parcel 1994). There is some overlap of parcel 2095 with 320239601001.

Table 21. BMDO March 2025 Oil & Gas Lease Sale Environmental Justice Study Area Block Group Data

Block Group	Description (ST, County, Key Relative Locations)	Low Income * (%)	Minority * (%)	Tribal # (%)	Total Population
320110001001	NV, Eureka, Dann Band Reservation	50.8	48.4	0.0	819
320110001002	NV, Eureka, Eureka	28.5	29.0	7.9	1,898
320239601001	NV, Nye, Yomba Reservation	13.2	5.3	0.0	722
320239601002	NV, Nye, Railroad Valley, Duckwater Reservation	42.5	0.0	0.0	565
320150003021	NV, Lander	39.2	22.6	2.0	919
320150003023	NV, Northern Lander	59.8	9.3	3.0	1,123
	Average all Block Groups	39.0	19.1	2.2	6,046
Reference area # (See above)		28.3	27.6 30.4 (MGA)	4.7	

Data Sources: United States Census Bureau American Community Survey Tables accessed via *=BLM EJ Mapping Tool, ^ = Headwaters Economics BLM EPS and SEP tools, and # = American Community Survey. MGA=Mean gross average.

Low-Income Environmental Justice Community Analysis

A low-income community of concern is present if 1) the population experiencing poverty in one or more analysis area geographies (US Census Block Groups) are near, at, or below 200 percent of the federal poverty threshold of the reference area OR 2) if the population of the community experiencing poverty is at or above 50 percent. Low-income environmental justice communities of concern are identified in the study area. It is estimated that 39.0 percent of the study area population is identified as low-income. This is greater than the reference area low-income percentage (28.3). This screening identified that five of the six census block groups within the study area have a low-income population that met this criterion (Appendix E, Figure 2).

Minority Environmental Justice Community Analysis

A minority community of concern is present if the percentage of the population identified as belonging to a minority group in a study area is 1) equal to or greater than 50 percent of the population OR 2) meets the “meaningfully greater” threshold. Meaningfully greater is calculated by comparing the minority group population percentage with 110 percent of the reference area minority population. Minority environmental justice communities of concern are identified in the study area. It is estimated that 19.1 percent of the study area population is identified as belonging to a minority population group. This is less than the reference area minority population percentage (27.6). This screening identified that three census block groups within the study area had a minority identified population that met this criterion (Appendix E, Figure 3).

Tribal / Native American Environmental Justice Community Analysis

Tribal communities of concern are present if the percentage of the population identified as belonging to an indigenous community is equal to or greater than the reference population. Tribal communities of concern are identified in the study area. It is estimated that 2.2 percent of the study area population is identified as belonging to a tribal population group. This is less than the reference area tribal population

percentage (4.7). This screening identified that one census block groups within the study area had a tribal identified population that met this criterion (Appendix E, Figure 4).

Environmental Effects

Low-income, minority, and tribal / Native American environmental justice populations are present. All but one census block group meet or exceed thresholds in at least one environmental justice community category. While the act of leasing parcels does not have direct disproportionate and adverse impacts to environmental justice communities, it is likely that exploration and development of lease parcels could disproportionately and adversely affect both low-income and minority environmental justice communities.

All lease parcels are located in low-income environmental justice identified census block groups. Minority environmental justice communities are near but not clustered near the Eureka County parcel. Tribal environmental justice communities are found throughout the study area and the potential for disproportionate and adverse impacts is high some lease parcels. Special consideration and outreach (beyond traditional government-to-government outreach and before exploration and development) must be made to tribal communities near the following parcels should exploration and/or development occur:

Future site development and production on leased parcels will require an additional Environmental Justice analysis to assess and evaluate potential disproportionate adverse effects to EJ population(s) present in the project area. Analysis should consist of a) identification of potential environmental justice communities; b) incorporation of community input and local knowledge following the development of a robust environmental justice outreach plan; and c) an aggregate analysis of potential community impacts regarding direct and indirect impact across all resource areas based on differential exposure, differential sensitivity, differential ability to take mitigating actions, and/or a differential ability to participate in the Project development process.

No Action Alternative

Under the No Action Alternative, the lease sale would not occur, and impacts to environmental justice communities would also not occur. Activities on currently leased parcels adjacent to the proposed parcels would remain on-going as permitted on surrounding federal, state, and private lands.

Cumulative Effects

Several ongoing and potential actions in the area, such as mining, oil and gas development, geothermal exploration, off-highway vehicle use, and livestock grazing, have the potential to cumulatively impact socioeconomics; likewise, environmental justice could be affected in ways already described above. The geographic scope or extent of cumulative effects for socioeconomics and environmental justice resources is dependent upon geographic area and proximity to population centers. Future project specific proposals will need to consider past, present and RFFAs in the required analysis for both socioeconomics and environmental justice.

3.5.19 Waste, Hazardous and Solid

Affected Environment

The majority of the proposed lease parcels are in rural areas and not adjacent to any schools or population centers. However, there are several ranches and ranching/mining communities within close proximity. Lessees are encouraged to speaking with and coordinating projects with local community emergency response services, to include event planning and response preparation in the case of an accident/release. Local county emergency response phone numbers are listed in Emergency Planning documents for proposed projects and are the first point of contact for APDs.

Federal and state governments specifically regulate each project to ensure that there are no releases of hazardous materials, hazardous waste or solid waste into the environment. Environmental consequences of the proposed action are discussed below.

Environmental Effects of the Proposed Action

Oil and gas activities including exploration drilling, extraction, production facilities, pipeline transport, and tanker loading, unloading and transport, have the potential to affect the environment through production of waste fluids and emissions resulting from field development and related infrastructure. Oil and gas production wells generate some petroleum contaminated soil, but this is typically cleaned and removed to containment areas for later disposal. Oil spills, produced waters, drill fluids/cuttings, and hazardous materials could be encountered at a facility or drill pad. The analysis area is not near activities generating hazardous or solid waste such as mining exploration or extraction operations. Under any alternative, all appropriate statutes, regulations and policies (see Section 1.6) and Gold Book standards, guidelines and BMPs would be applied.

The RFD scenario predicts that approximately 25 exploration wells would be drilled and 65-100 acres of surface disturbance associated with potential oil and gas exploration and production activities could be expected to occur in the Battle Mountain District over the next ten years. Environmental effects from hazardous materials, hazardous waste, and solid waste which might be encountered during each phase are provided below. However, most of these incidental effects, if not all, can be avoided or lessened through proper inspection and maintenance.

Exploration: Effects could include drilling fluid or hydrocarbon spills, leakage from improperly constructed reserve pits or wastewater collection systems, improperly handled brine backflow water from drilling that may or may not have used HF technology, and accumulations of solid waste, which could impact water quality or contaminate soils. Hydrocarbon spills could consist of hydraulic fluid, gasoline, diesel, oil, or grease from vehicles, generators, and exploration drill rigs. Backflow water from exploration drilling can be extremely saline; improper disposal could raise the pH of existing surface waters to unacceptable levels. Accumulations of nonhazardous solid waste could include trash, drill cuttings or mud, wastewater, bentonite, and cement generated during drilling operations.

Development: Impacts could be the same as in the exploration phase; however, the quantities of hazardous materials, hazardous waste, or solid waste used and generated could be greater depending on the project proposal. Accidental releases from reserve pits or wastewater collection systems could include hazardous water treatment chemicals such as chlorine. Storm water runoff could contain elevated quantities of heavy metals and volatile organic compounds. When fracked water comes back to the surface as backflow, it can contain high levels of salts, introduced chemical additives, and various chemicals and compounds that occur naturally within the earth. Backflow spills have been known to kill off all vegetation and render the soil unusable. Nonhazardous solid waste such as drill cuttings or mud could be generated at this stage.

Production: Routine plant operations could involve leaks or spills of substances such as hydraulic fluid, gasoline, diesel, oil, paint, antifreeze, cleaning solvents, transformer insulating fluid, and grease. These discharges could result in impacts to water, soil, air, and wildlife. Storm water runoff containing heavy metals and VOCs could be problematic. Nonhazardous solid waste could also be generated.

Final Abandonment: The operator would identify, remove, and properly dispose all hazardous materials, hazardous waste, and solid waste. Spills could occur during removal.

When the RFD scenario is considered, effects to human health would generally be negligible because the substances involved would be properly handled, stored, and disposed of in accordance with applicable federal, state, and local regulations. Proper management of these substances would ensure that no soil, ground water, or surface water contamination would occur with any adverse effect on wildlife, worker health and safety, or surrounding communities. Additional project- and site-specific environmental

analysis of any future exploration, development and/or production would allow inclusion of updated mitigation measures, BMPs, and COAs; and performance standards would be defined at that time.

Effects of hazardous waste spills in areas with surface water resources could be exacerbated and difficult to mitigate though the CSU Water Resources stipulation would require avoiding impacts within 500 feet of surface waters and riparian areas; and effects to floodplains and playas. Application of this stipulation would not only prevent surface disturbance within the defined areas but would also prevent accidental contamination.

No Action Alternative

Under the No Action Alternative, the parcel(s) would not be leased, and no new oil and gas development would occur on the subject lease parcels; therefore, no new wastes, either hazardous or solid would occur on those lands except on adjacent authorized leases for activities on surrounding federal, state, and private lands.

Cumulative Effects

The disturbance associated with oil and gas exploration and production would add to the disturbances from mineral exploration, mine development, grazing management, wildfires, fire rehabilitation and range improvement projects, land use authorizations, and fluid mineral exploration and development.

Incremental surface disturbance and infrastructure removes the base for ecological systems. Although all human activities influence the natural setting, it is a matter of federal law to properly dispose of waste.

Developments on public lands usually include waste, hazardous and solid, disposal plans prior to project approval. This includes oil and gas drilling and development; thus, the cumulative impacts to the environment from wastes is expected to be minimal due to the relatively small area of disturbance in the RFD scenario, concurrent reclamation, and the development of site-specific mitigation and BMPs.

3.5.20 Human Health and Safety

Affected Environment

The BMD consists of 10.4 million acres of BLM-managed public land. There are 106 abandoned, expired, active, and shut-in oil and gas wells. The majority are located in Railroad Valley. The development has resulted in the following public health and safety-related risks: occasional fire starts; spills of hazardous materials, hydrocarbons, and produced water and corresponding potential contamination of air, soil, or water; exposure to naturally occurring radioactive material in drill cuttings or produced water (see Appendix C and H); infrequent industrial accidents; presence of hydrogen sulfide (H₂S); or increased levels of fugitive dust (PM₁₀ and PM_{2.5}), other criteria air pollutants (CAPs), volatile organic compounds (VOCs), and hazardous air pollutants (HAPs). See the air quality analysis in 3.5.1 and 3.5.2 for projected levels of CAPs, HAPs, and their effects on air quality standards. HAPs are known or suspected to cause cancer or other serious health effects, such as compromises to immune and reproductive systems, birth defects, developmental disorders, or adverse environmental effects resulting from either chronic (long-term) and/or acute (short-term) exposure, and/or adverse environmental effects. Breathing ozone (O₃) can trigger a variety of health problems, including coughing and sore or scratchy throat; difficulty breathing deeply and vigorously and pain when taking deep breaths; inflammation and damage to the airways; increased susceptibility to lung infections; aggravation of lung diseases such as asthma, emphysema, and chronic bronchitis; and an increase in the frequency of asthma attacks. Some of these effects have been found even in healthy people, but effects are more serious in people with lung diseases such as asthma. Particulate matter, also known as particle pollution or PM, is a complex mixture of extremely small particles and liquid droplets. Smaller particles are associated with more negative health effects, including respiratory and cardiovascular problems, because they can become more deeply embedded in the lungs and may even get into the bloodstream.

The following links provide additional information on air pollution health effects:

Criteria Pollutants

- Ozone (<https://www.epa.gov/ground-level-ozone-pollution>) (EPA, 2023)
- Particulates (<https://www.epa.gov/pm-pollution/particulate-matter-pm-basics>) (EPA, 2023)
- Nitrogen dioxide (<https://www.epa.gov/no2-pollution/basic-information-about-no2>) (EPA, 2023)
- Carbon monoxide (<https://www.epa.gov/co-pollution/basic-information-about-carbonmonoxide-co-outdoor-air-pollution#What%20is%20CO>) (EPA, 2023)
- Lead (<https://www.epa.gov/lead-air-pollution/basic-information-about-lead-airpollution#health>) (EPA, 2023)
- Sulfur dioxide (<https://www.epa.gov/so2-pollution/sulfur-dioxide-basics#effects>) (EPA, 2023)
- Hazardous air pollutants (<https://www.epa.gov/haps/health-effects-notebook-hazardous-airpollutants>) (EPA, 2023)

While the air quality analysis, Section 3.5.1 and 3.5.2, estimates the risk of cancer and/or other health impacts solely based on exposure to HAPs, other economic or social indicators can also influence the general health risks of a population, such as poverty status, educational attainment, or language proficiency. Headwaters Economics data for populations at risk (i.e., more likely to experience adverse health outcomes due to demographic or socioeconomic factors) show that most of the indicators for populations at risk are lower for the state of Nevada compared with the nation as a whole (U.S. Department of Commerce, 2023).

Human health risk assessments cannot be performed until project-specific details are known so that frequency, timing, and levels of contact with potential stressors may be identified (EPA, 2023). However, each of the reasonably foreseeable environmental trends and planned actions have been, or will be, subject to relevant rules and regulations regarding public health and safety. Ongoing and future potential development would continue to present aggregate risks to human health as detailed above. When wells reach the end of their useful life and are properly plugged and reclaimed, they would no longer contribute to health and safety effects; however, depending on the level and duration of individual's exposure during well operation, some of the public health effects from air pollution may endure beyond the life of the wells (e.g., chronic respiratory problems such as asthma).

Future potential development on the nominated lease parcels is estimated to be 25 new wells for this lease sale. This is a 0.5% increase in addition to the 106 existing active wells. When authorizing development, federal and state laws, regulations, and policy are applied to reduce effects or respond to incidents. These include the following:

- Federal, state, county, and municipal fire managers shall coordinate on fire response and mitigation.
- Developers who install and operate oil and gas wells, facilities, and pipelines are responsible for complying with the applicable laws and regulations governing hazardous materials and for following all hazardous spill response plans and stipulations. The Nevada Division of Minerals requires similar spill response measures after release of hydrocarbons, produced water, or hydraulic fracturing fluids.

Environmental effects of the proposed action are discussed below.

Environmental Effects of the Proposed Action

The proposed lease parcels are located in three areas in BMD. Parcel 1994 is located adjacent to private land and lies approximately twenty-three miles northwest of the Duckwater Shoshone Indian Reservation in Little Smoky Valley by the Fish Creek Ranch. Parcel 6968 is along Highway 6 about four miles from Lockes Ranch, and about fifteen miles from Currant. The remaining parcels, 2095, 2097, 2100, 2102,

2106, 2107, 2112, 7030, and 7031 are approximately three miles from the Toiyabe Forest and the small community of Kingston. These rural areas are remote with no school or population centers nearby.

The analysis area is not near activities generating hazardous or solid waste such as mining exploration or extraction operations. Although there is recent interest in soluble lithium, the type of extraction is expected to be smaller than oil and gas exploration using similar equipment and generating similar waste types as one expects from oil and gas or water well drilling. The existing geothermal leases would be developed in a similar manner as those for oil and gas.

The small acreage of oil and gas activity and associated disturbance identified in the RFD and, considering the existing oil and gas development in the area, the contribution to further effects would be negligible. Federal and state governments specifically regulate each project to ensure that there are no releases of hazardous materials, hazardous waste or solid waste into the environment.

No Action Alternative

Under the No Action Alternative, the parcel(s) would not be leased, and no new oil and gas development would occur on the subject lease parcels; therefore, no new health and human safety issues could arise other than from previously permitted activities and for new proposals on public lands, not associated with this lease sale. All activities occurring on public land would be required to follow local, state, and federal laws and regulations.

Cumulative Effects

The disturbance associated with oil and gas exploration and production would add to the disturbances from mineral exploration, mine development, grazing management, wildfires, fire rehabilitation and range improvement projects, land use authorizations, and fluid mineral exploration and development. Incremental surface disturbance and cumulative activities on public land increase opportunities for pollution, and pollutants in air, water, and soil. Public health and safety regulations exist for these resources; thus, the cumulative impacts to health and human safety are expected to be minimal due to the relatively small area of disturbance in the RFD timeframe, concurrent reclamation, and the development of site-specific mitigation and BMPs.

Chapter 4. List of Preparers

An ID Team prepared the document and analyzed the effects of the proposed action and alternatives upon the various resources (Table 22). They considered the affected environment and documented the effects to resources in the body of the EA.

Table 22. List of specialists

Resources	Specialists
Air Quality, Greenhouse Gas, and Climate Change	Franklin Giles
Water Resources	Jamie Dohm
Soils, Vegetation, Rangeland Resources	Zachary Long
Noxious Weeds, Invasive Non-native Species	Zachary Long
Wildlife Resources and Special Status Species	Sarah Levane
Cultural Resources and Paleontology	Caitlin Rankin
Native American Cultural and Religious Concerns	Ashton Jenks
Recreation, Visual Resources, Wilderness Characteristics	Kenner Vorheis
Geology and Minerals	Matthew Wood
Land Use Authorizations	Jeanette Huitt

Socioeconomics and Environmental Justice	Melissa Jennings
Waste, Hazardous and Solid, Health and Human Safety	Jensen Reese
NEPA compliance	Melissa Jennings

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