



US. Department of the Interior
Bureau of Land Management

Preliminary Ely District 2024 Second Quarter Competitive Oil and Gas Lease Sale

DOI-BLM-NV-L000-2024-0001-EA

February 27, 2024

Ely District Office
702 N. Industrial Way
Ely, Nevada 89301
(775) 289-1800

Chapter 1. Introduction.....	5
1.1. Background.....	5
1.2. Project Location.....	6
1.3. Purpose and Need for Action.....	9
1.4. Decision to be Made	9
1.5. Land Use Plan Conformance	9
1.6. Tiering and Incorporation by Reference	9
1.7. Relationship to Statutes, Regulations or Other Plans.....	10
1.8. Public Involvement.....	12
Chapter 2. Proposed Action and Alternatives.....	14
2.1. Alternative A- Proposed Action.....	14
2.2. Alternative B-No Action or No Leasing.....	14
2.3. Alternatives Considered but Not Analyzed in Detail.....	15
2.4. Reasonably Foreseeable Future Development Scenario.....	15
2.4.1. General Assumptions for the RFFD Scenario.....	16
2.4.2. Exploration Drilling and Production Assumption.....	17
2.4.3. Production.....	17
2.4.4. Well Stimulation	18
Chapter 3. Affected Environment and Environmental Effects.....	19
3.1. Analysis Process Overview.....	19
3.1.1. Methods and Assumptions.....	19
3.1.2. Affected Area and Degree of Effects	19
3.1.3. Time Period Considered.....	19
3.1.4. Analysis Area.....	20
3.1.5. Supplemental Authorities and Other Resources Considered	20
3.2. Environmental Effects of Alternative A and Alternative B	24
3.2.1. Air Quality and Climate Change.....	24
3.2.2. Cultural Resources	35
3.2.3. Environmental Justice and Socioeconomics	36
3.2.4. Soils.....	41
3.2.5. Human Health and Safety	42
3.2.6. Native American Religious and other Concerns.....	44
3.2.7. Wastes, Hazardous and Solid.....	44

3.2.8.	Water Resources: Surface and Ground	46
3.2.9.	Vegetation Resources.....	48
3.2.10.	Fish and Wildlife.....	49
3.2.11.	Visual Resource Management	52
3.2.12.	Livestock Grazing	54
3.2.13.	Geology and Mineral Extraction.....	55
Chapter 4.	Cumulative Impacts.....	58
4.1.	Resources	58
4.2.	Past, Present, and Reasonably Foreseeable Future Actions	58
4.3.	Cumulative Impacts	59
4.3.1.	Air Quality, Greenhouse Gas (GHG) and Climate Change	59
4.3.2.	Cultural Resources	66
4.3.3.	Environmental Justice and Socioeconomics	66
4.3.4.	Soils.....	67
4.3.5.	Human Health and Safety	67
4.3.6.	Native American Religious and other Concerns	68
4.3.7.	Wastes, Hazardous and Solid.....	69
4.3.8.	Water Resources: Surface and Ground	69
4.3.9.	Vegetation Resources.....	70
4.3.10.	Fish and Wildlife, Special Status Species, Threatened and Endangered Species, Migratory Birds.....	70
4.3.11.	Visual Resource Management	71
4.3.12.	Livestock Grazing	71
4.3.13.	Geology and Mineral Extraction.....	72
Chapter 5.	Consultation and Coordination	73
5.1.	Individuals, Organizations, and Tribes Consulted.....	73
5.1.1.	Individuals and Organizations	73
5.1.2.	Tribes	73
Chapter 6.	List of Preparers	74
Chapter 7.	References.....	75
Appendix A-	Maps.....	78
Appendix B-	Supporting Tables	80
Appendix C -	Nominated Parcel.....	83
Appendix D-	Stipulations and Lease Notices.....	85
Appendix E-	Ely District Best Management Practices for Oil & Gas.....	89

Appendix F-Hydraulic Fracturing Technology Paper	96
Appendix I -Analysis Tiered to and Incorporated by Reference.....	108
Appendix J-Leasing Preference Ratings for Nominated Lease Parcels.....	115

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 support 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] 3101.1-2) 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 (NSO) 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 NSO reviews the nominations, removes lands not legally available for leasing, and compiles the remaining lands, NSO 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 3101.1-3).

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 substantive 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 June 25, 2024.

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 3107.2)³. A producing lease can be held indefinitely by economic production.

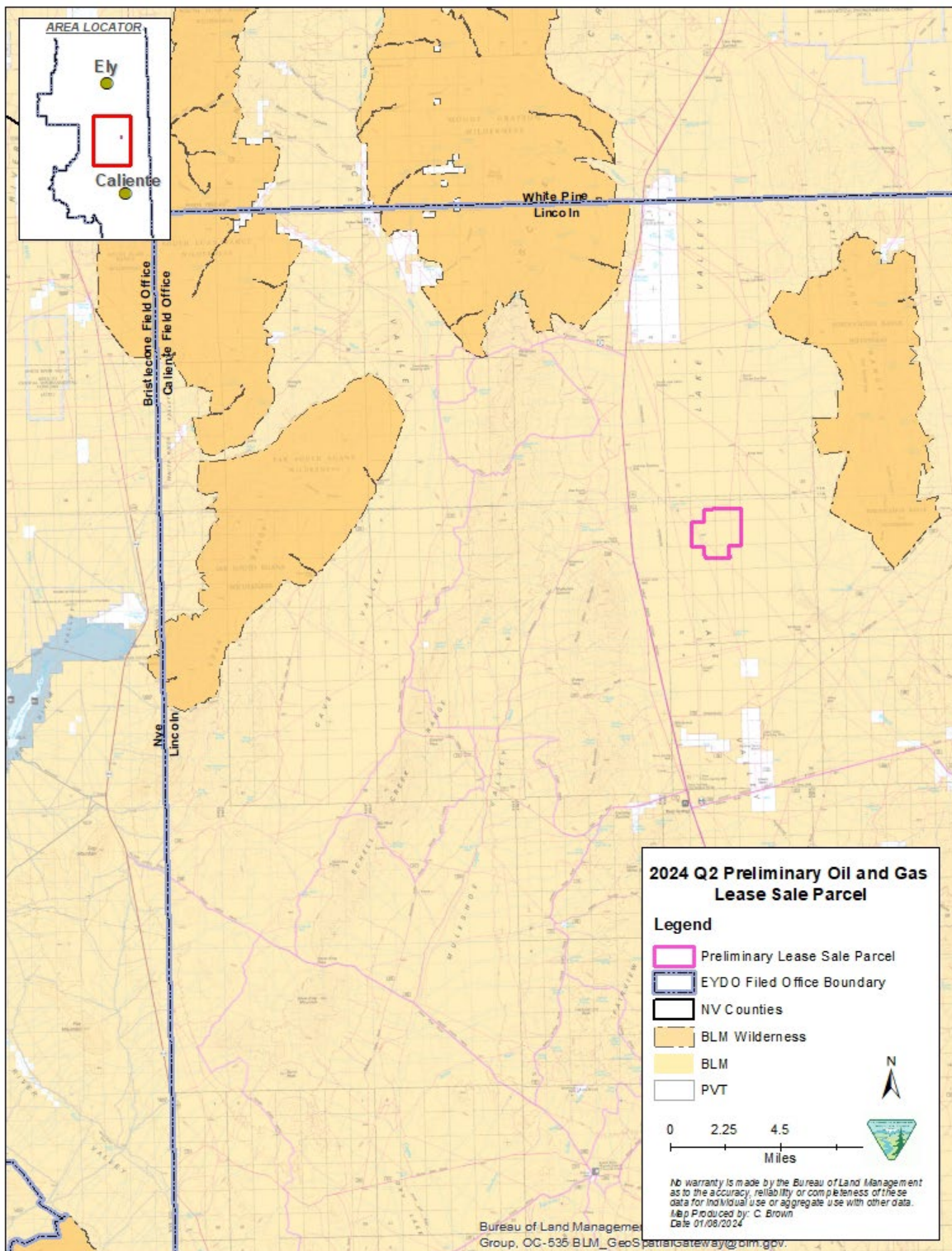
The Mineral Leasing Act (MLA) of 1920, as amended by the Federal Coal Leasing Amendments Act of 1976, affect an entity's qualifications to obtain an oil and gas lease. Section 2(a)(2)(A) of the MLA, 30 U.S.C. 201(a)(2)(A), requires that any entity that holds and has held a Federal Coal Lease for 10 years 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.

1.2. Project Location

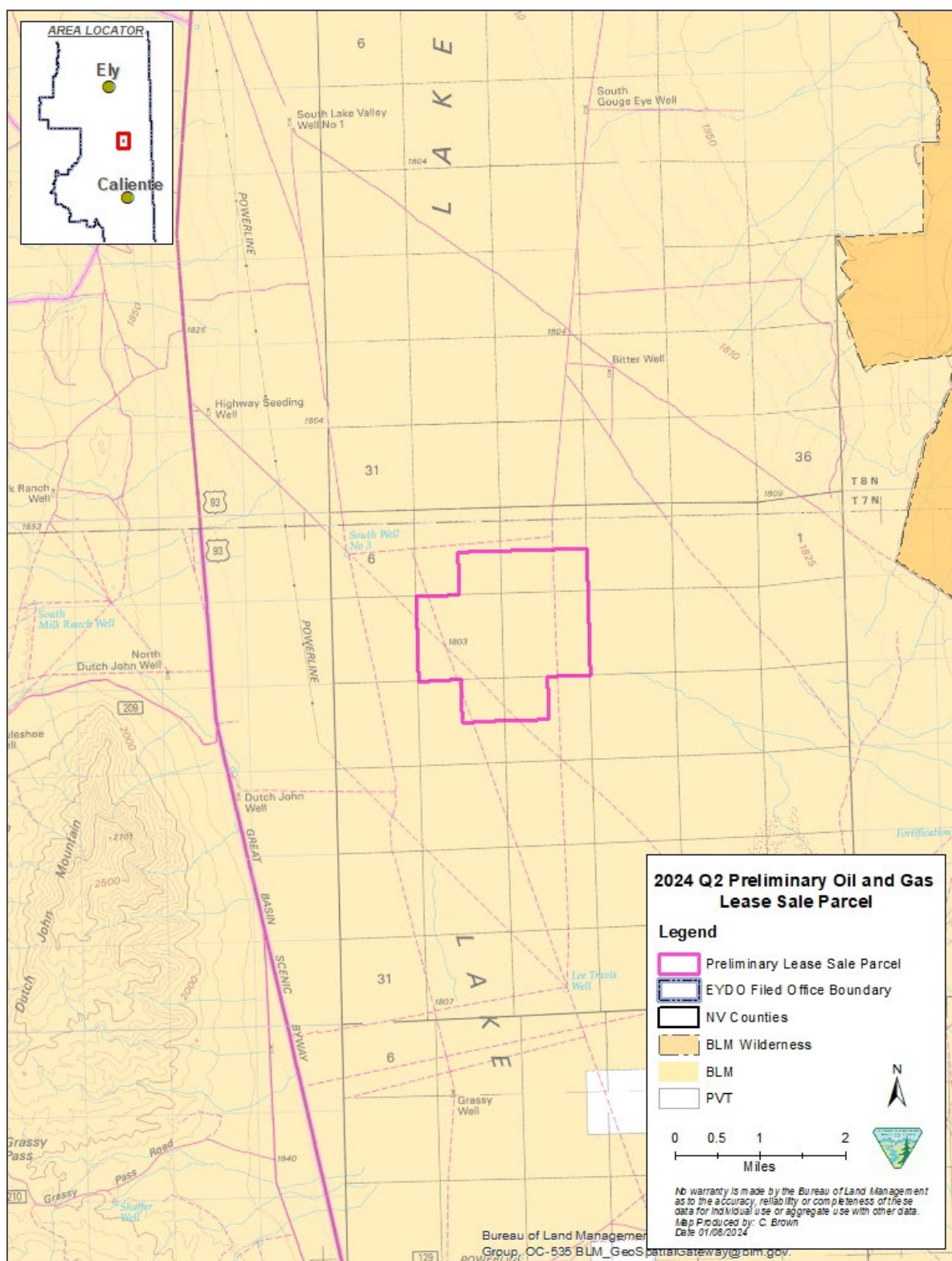
The Bureau of Land Management (BLM) Caliente Field Office (CFO) encompasses about 5.6 million acres of public lands managed by the BLM. The June 2024 preliminary parcel list (Appendix C) contains 1 parcel covering 2,080 acres in the Caliente Field Office that would be offered during the June 2024 Competitive Oil and Gas Lease Sale. The lease parcel is located in Lake Valley, northern Lincoln County, Nevada. (Maps 1-2)

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.



Map 1. Overview map showing the proposed parcel analyzed in the June 2024 Oil and Gas Lease Sale EA



1.3. Purpose and Need for Action

The purpose of this action is for the EYDO 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 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 3101.1 and 43 CFR 1601.0-7(b); BLM Manual 1601.09 and Handbook H-1624-1).

The Proposed Action is in conformance with the Ely District Record of Decision and Approved Resource Management Plan, and all subsequent applicable amendments. The RMP addresses land use goals and objectives, allowable uses, and management actions for the field office.

Ely District RMP, Approved 2008

The Proposed Action is in conformance with the Goals and Objectives of the Ely District Record of Decision and Approved Resource Management Plan (BLM 2008, the Ely District RMP), as amended, which are to: *"provide for the responsible development of mineral resources to meet local, regional, and national needs, while providing for the protection of other resources and uses (page 92)."* The RMP also states in part, *"It is BLM policy to apply the least restrictive constraint to meet the resource protection objective (page 97)."* In addition, *"Timing limitations indicate that a leased area generally is open to development activities except during a specified period of time to protect identified resource values such as wildlife (page 92)."* The stipulations for Fluid Minerals Lease Notices in Appendix A, Section 2 of the Ely District RMP were updated February 11, 2015 under a plan maintenance action.

The best available science was used by Resource Specialists (hereby referred to as the interdisciplinary team, or ID Team) to analyze the effects to their respective resources as a result of the Proposed Action. Stipulations were applied based on the analysis in the 2007 Ely Proposed Resource Management Plan/Final Environmental Impact Statement (Ely District PRMP/FEIS) and the Ely District RMP.

1.6. Tiering and Incorporation by Reference

This document tiers to and incorporates by reference the following documents as appropriate when discussing the affected environment, existing and current conditions, impacts analysis, and stipulations and conditions:

- 2008 Ely District Record of Decision and Approved Resource Management Plan (2008 Ely District RMP)

- 2007 Ely Proposed Resource Management Plan/Final Environmental Impact Statement (2007 Ely District PRMP/FEIS)

1.7. Relationship to Statutes, Regulations or Other Plans

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); 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) (16 U.S.C. 668) prohibits the direct or indirect take of an eagle, eagle part or product, nest, or egg. The term “take” includes “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb.” The U.S. Fish and Wildlife Service (USFWS) has guidance for proposed projects that have the potential to impact eagles or their habitat; BLM biologists and USFWS would address this at the time of additional project-specific analysis.

BLM and Nevada Department of Wildlife (NDOW) Memorandum of Understanding (MOU) directs the agencies’ cooperative management of wildlife and fish resources and their habitat on public lands, as established in 1971. The BLM meets its obligations under the MOU by managing public lands to protect and enhance food, shelter, and breeding areas for wild animals.

BLM Special Status Species (SSS) are designated by the State Director for each state and are defined as those plant and animal species for which population viability is a concern, as evidenced by a significant current or predicted downward trend in population numbers or density, or in habitat capability that would reduce the species’ existing distribution. BLM manages SSS habitats so as to promote their continuing viability. BLM Manual 6840, Special Status Species Management provides additional guidance.

Clean Air Act of 1970, as amended and supplemented by subsequent legislation, established air quality standards to protect health and public welfare and to regulate emissions of hazardous air pollutants.

Clean Water Act of 1972 provides extensive direction regarding the degradation of water sources. The Clean Water Act originally applied to “navigable waters”; the United States Supreme Court determined in the 2006 case *Rapanos v. United States* that it also held for “waters of the United States,” defined as “including only those relatively permanent, standing or continuously flowing bodies of water forming geographic features” that are described as “streams[,] ... oceans, rivers, [and] lakes.”

Endangered Species Act (ESA) of 1973, Section 7, requires federal agencies to “insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat of such species.”

Energy Policy Act of 2005, which is directed towards a reduced dependence on foreign energy sources and encourages the development of alternative energy.

Executive Order (EO) 11988 –instructs all federal agencies to avoid development in a floodplain whenever possible; ***EO 13690*** provides further instruction, along with FEMA guidelines for implementing both (FEMA 2015).

Executive Order 11990 – Protection of wetlands tells agencies to “minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands” and instructs, “when Federally-owned wetlands or portions of wetlands are proposed for lease, easement, right-of-way or disposal to non-Federal public or private parties, the Federal agency shall (a) reference in the conveyance those uses that are restricted under identified Federal, State or local wetlands regulations;

and (b) attach other appropriate restrictions to the uses of properties by the grantee or purchaser and any successor, except where prohibited by law; or (c) withhold such properties from disposal.”

Executive Order 12898 required federal agencies to promote environmental justice by determining, and addressing as needed, whether the agency’s programs, policies, and activities have a disproportionately high and adverse human health or environmental effects on minority populations and low-income populations. When considered at a scale of county sub-regions surrounding the Analysis Area, while there are no known communities with disproportionate representation of any minority race or ethnicity as compared to the state of Nevada overall, the region does have an American Indian population as compared to the state overall; however, it would not be disproportionately affected. See Section 3.2.3.

Executive Order 14008 required federal agencies to consider the effects of greenhouse gas emissions and climate change when deciding on federal actions.

Federal Land Policy and Management Act of 1976, as amended, directs the Secretary of the Interior to manage the public lands for multiple use and sustained yields.

Instruction Memo 2023-007 Evaluating Competitive Oil and Gas Lease Sale Parcels for Future Lease Sales: Provides direction for assessing lease sale parcels to be included in competitive lease sales, including preference for proximity to existing development and avoiding parcels in habitat connectivity areas.

Instruction Memo 2023-008 Impacts of the Inflation Reduction Act of 2022 (Pub. L. No. 117-169) to the Oil and Natural Gas: Summarizes the changes to BLM fiscal terms and the termination of noncompetitive leasing, including the impact on pending leases.

Instruction Memo 2023-010 Oil and Gas Leasing – Land Use Planning and Lease Parcel Reviews: Replaces IM 2021-027 to update the leasing process, including consistency with the Inflation Reduction Act. This includes identifying potential lease parcels, setting out opportunities for public participation and requirements for environmental analysis, providing a specific option for the BLM to use a formal nomination process and confirming the Inflation Reduction Act’s prohibition on noncompetitive leasing.

Mineral Leasing Act of 1920, as amended and supplemented by subsequent legislation, provides for the authorization of BLM to administer leasing of public lands for leasable minerals.

National Historic Preservation Act (NHPA) Section 106 requires Federal agencies to take into account the effects of their undertakings on historic properties. The BLM also must comply with the Nevada State Historic Preservation Office (SHPO) protocol agreement, which is authorized by the National Programmatic Agreement between the BLM, the Advisory Council on Historic Preservation and the National Conference of State Historic Preservation Officers.

Safe Drinking Water Act is the federal law that protects public drinking water supplies throughout the nation. The U.S. Environmental Protection Agency (EPA) sets standards for drinking water quality and, with its partners, implements various technical and financial programs.

Secretarial Order 3289 addresses current and future impacts of climate change on America’s land, water, wildlife, cultural-heritage, and tribal resources.

Secretarial Order 3347 tasks the Department with enhancing conservation stewardship, increasing outdoor recreation opportunities, and improving the management of game species and their habitat.

Secretarial Order 3356 directs the Department to use best available scientific information and to coordinate with State fish and game agencies on energy-related development decisions.

Secretarial Order 3362 directs the Department to improve habitat quality in Western Big-Game Winter Range and Migration Corridors.

Migratory Bird Treaty Act (MBTA) of 1918 protects migratory birds, with the exception of native resident game birds. Under this act, nests with eggs or the young of migratory birds may not be harmed, nor may any migratory birds be killed. ***EO 13186*** (2001) provided federal agencies with further direction to implement the MBTA.

Wild Free-Roaming Horse and Burro Act of 1971 (WFRHBA) directs the BLM's responsibility for the protection, management and control of wild horses and burros "in a manner that is designed to achieve and maintain a thriving natural ecological balance on the public lands." The BLM is mandated to manage wild horses and burros only within those areas on public lands where they were found in 1971 when the WFRHBA was passed. They cannot be relocated elsewhere in the District; new Herd Management Areas (HMAs) cannot be created; and BLM cannot expand the HMAs to replace habitat lost. Management guidance includes 43 CFR 4700 and the Wild Horses and Burros Management Handbook H-4700-1.

1.8. Public Involvement

External scoping: In preparation for the lease sale, BLM released the current parcel list, maps, and shapefiles to the public for scoping comments from November 27th to December 27th, 2023. The BLM received 7 scoping letters on the lease sale. Scoping comments were similar-themed and include topics such as compliance with NEPA, greenhouse gases and climate change, delaying or halting leasing, leasing reform, updating resource management plans, protection for wildlife habitats, environmental justice communities, cultural properties, human health and safety, water rights and water resource protection. This list is not all inclusive.

After review of Scoping comments received from The Nevada Department of Wildlife (NDOW), the 1 parcel located within the Bristlecone Field Office was not carried forward for analysis. due to the proximity of the parcel to Kirch Wildlife Management Area (WMA) and an existing Memorandum of understanding with the Nevada Department of Wildlife concerning development within one mile of the WMA

Internal Scoping: In preparing the preliminary EA that would be released for public comment, the Bristlecone and Caliente Field Office ID Teams internally scoped the project on December 18, 2023.

Native American Coordination: The Ely District Office invited Tribes to engage in Government-to-Government consultation as directed in Executive Order 13175, Consultation and Coordination with Indian Tribal Governments. A list of the Tribes who were sent certified letters inviting them to formal consultation can be found in Chapter 5, section 5.1.1. Tribes may conduct field visits if an Application for Permit to Drill (APD) is submitted for any of these parcels. The opportunity for Tribes to initiate formal Government-to-Government consultation is on-going.

Recent Court Decisions:

On February 11, 2022, the United States District Court for the Western District of Louisiana issued an order that, in general, enjoined the Department, among other agencies, from taking action in connection with Section 5 of Executive Order 13990 and the Interagency Working Group ("IWG") established by that Order relating to the measurement of the Social Cost of Greenhouse Gases.

Because this proposed sale relies upon the IWG and Section 5 of the Executive Order, the District Court's injunction precluded the Department from advancing this and similar proposed sales. On March 16, 2022, the Court of Appeals for the Fifth Circuit stayed the injunction pending appeal. Louisiana by & through Landry v. Biden, No. 22-30087, 2022 WL 866282 (5th Cir. Mar. 16, 2022).

Previously, on January 27, 2022, the United States District Court for the District of Columbia issued a decision in *Friends of the Earth v. Haaland*, vacating offshore oil and gas lease sale 257 because the Department did not quantify the effects of that sale on emissions from the foreign consumption of oil and gas, despite (in the Court's view) possessing the tools and methodology to do so. 2022 WL 254526

(D.D.C. Jan. 27, 2021). Given the analysis presently available to BLM, Friends of the Earth does not affect BLM's analysis of this proposed lease sale.

Unlike the Bureau of Ocean Energy Management ("BOEM")—the agency responsible for sale 257—the Bureau of Land Management has not traditionally used simulation tools like MarketSim (the tool at issue in Friends of the Earth and used by BOEM in preparation for sale 257) when evaluating effects on foreign consumption from proposed BLM State Office lease sales. Indeed, the Friends of the Earth Court recognized that it had previously upheld BLM's decision not to consider foreign effects where BLM had "refused to quantify emissions resulting from particular lease parcels, and thus could not conceptualize the extent to which the lease sales would contribute to the local, regional, and global climate change." 2022 WL 254526, at *13 n.13 (quotation omitted). Likewise, the Court ruled against BOEM for forgoing the foreign consumption analysis for sale 257 in part because BOEM shortly thereafter applied that analysis to a draft NEPA analysis for proposed offshore sale 258. The court's reasoning does not apply to BLM, which, as noted above, lacks access to any historic or imminent foreign effects analysis at the level of individual BLM State Office lease sales. If and when BLM undertakes this or similar analysis in the future, it may be appropriate to include and consider that analysis when proposing onshore lease sales.

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 D, with the parcels to which each stipulation would apply.

2.1. Alternative A- Proposed Action

Under the Proposed Action, 1 parcel covering 2,080 acres in the Caliente Field Office would be offered during the June 2024 Competitive Oil and Gas Lease Sale. The lease parcel is located in Lake Valley, northern Lincoln County, Nevada. The lease 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 along with the corresponding stipulations and lease notices added to address resource issues found through review and analysis that would be attached to each parcel are located within the Stipulations Appendix (Appendix D). 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 3101.1-2 allow for the relocation of proposed oil and gas leasing operations up to 200 meters and/or timing limitations up to 60 days to provide additional protection 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 Future Development (RFFD) Scenario is assumed wherein all nominated parcels would be developed.

2.2. Alternative B-No Action or No Leasing

In accordance with BLM NEPA guidelines H-1790-1, Chapter 6, this EA evaluates a No Leasing Alternative. Alternative B forms a baseline for assessing and comparing the potential impacts of the other alternatives. Under this alternative, no parcels in the Ely District would be offered for lease in June 2024. 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. Alternatives Considered but Not Analyzed in Detail

The preliminary parcel list received on November 4, 2022, included 2 proposed parcels for inclusion in the Ely District 2024 Second Quarter Proposed Competitive Oil and Gas Lease Sale. After review of Scoping comments received from November 27th to December 27th, 2023, the 1 parcel located within the Bristlecone Field Office was not carried forward for analysis. due to the proximity of the parcel to Kirch WMA and an existing Memorandum of understanding with the Nevada Department of Wildlife concerning development within one mile of the WMA.

2.4. Reasonably Foreseeable Future Development Scenario

A Reasonably Foreseeable Future Development scenario (RFFD) for oil and gas is a long-term projection of oil and gas exploration, development, production, and reclamation activity. The RFFD covers oil and gas activity in a defined area for a specified period of time and provides the basis for the analysis of the environmental effects in Chapter 3 & 4 of this document. The RFFD scenario was developed based on past exploration activities and estimates of future exploration and development activity given the potential occurrence of resources (BLM 2007; page 4.18–3).

The RFFD projects a baseline scenario of activity assuming all potentially productive areas can be open under standard lease terms and conditions, except those areas designated as closed to leasing by law, regulation, or executive order. The RFFD provides the mechanism to analyze the effect that discretionary management decisions have on oil and gas activity. The RFFD also provides the basic information that is analyzed in the NEPA document. The RFFD discloses indirect future or potential impacts that could occur once the lands are leased. Prior to any future development, the BLM would require a site-specific NEPA analysis at the exploration and development stages.

Fluid mineral development potential in the analysis area is based on RFFD scenario for oil and gas developed in conformance with BLM Instruction Memorandum No. 2004–089 (BLM 2004). This analysis is based largely on the reasonably foreseeable development scenarios presented in detail in the fluid mineral report prepared for the RMP/FEIS (ENSR 2004), available at the Ely District Office. Various additional assumptions have been incorporated based on changes in the mineral markets in the recent past. It is impossible to predict with certainty how resource development would occur in the future. The interaction of prices, markets, technology, and environmental concerns all play a role.

The RFFD for the analysis area is based on the geology, oil and gas development history, oil and gas potential, BLM well data, and data from other EAs for oil and gas leases in eastern Nevada.

The RFFD scenario is made without respect to any existing or proposed leasing stipulations and conditions of approval in accordance with BLM guidance. The Proposed Action does not include any surface disturbance, such as exploration, development, production, or final reclamation of oil and gas resources. However, the authorization of oil and gas leasing does convey a right to subsequent exploration and production activities subject to stipulations, restrictions from non-discretionary statutes, COAs, and other reasonable measures required to minimize adverse impacts (CFR 3101.1–2). Therefore, this EA would consider possible impacts from potential indirect effects under the RFFD scenario. The following table summarizes the RFFD assumptions in comparison to this EA extrapolated from the RMP.

Table 2.1 Ely RMP Reasonably Foreseeable Future Development Scenarios (RFFD)

Facility Type	Number of Facilities	Short-term Disturbance (acres)	Long-term Disturbance (acres)
Seismic Survey	30 miles/year	<1000	0
Exploration Well Disturbances	200 wells and 1000 miles of road	5600	590
Small Well Field Developments	40 wells	745	359
Abandoned well pads (small field)	48 wells	178	0
Large Well Field Developments	100 wells	996	432
Abandoned well pads (large field)	60 wells	222	0
Refinery Facilities	1 refinery	65	20
Total		8406	1401
<p><u>Notes:</u></p> <p>Short-term applies to effects occurring in the immediate future and persisting for less than 10 years; long-term applies to effects occurring or lasting beyond 10 years (10–20 years).</p> <p>Summarized from Table 4.18–2 in the Ely RMP/FEIS (2007, page 4.18–5)</p>			

2.4.1. General Assumptions for the RFFD Scenario

The following is a list of general assumptions upon which the reasonably foreseeable development scenarios is based (BLM 2007).

- The RFFD would occur over a span of 20 years.
- There would be no major regulatory changes in federal or state statutes, regulations, policy and guidance that govern the exploration and development of fluid minerals, including lease royalty provisions and lease rental fees.
- Oil prices would remain sufficiently high to stimulate continued exploration and drilling. Recent historic highs in the price of oil may stimulate exploration activity above levels of the recent past. It is possible that higher prices may persist for the next few years. The RFFD is a planning tool that was developed to accommodate the maximum development that could reasonably be expected to occur. However, actual activity levels, as with prices, cannot be predicted with certainty.
- It cannot be predicted at this time how much acreage eventually would be held by production, which is entirely dependent on the discovery of commercial oil and gas fields.
- New field discoveries would be similar in size and surface disturbance to the Trap Springs and Kate Springs oil fields within Railroad Valley.
- The RFFD scenario is made without respect to any existing or proposed leasing stipulations and conditions of approval in accordance with BLM guidance.

- Actual locations of potential exploration wells and field development are unknown. The impacts associated with these activities are likely to occur anywhere within the planning area that is of high, moderate, or even low potential for oil and gas resources.

2.4.2. Exploration Drilling and Production Assumption

Actual locations of potential exploration wells and field development are unknown. The impacts associated with these activities could occur anywhere within the leased parcels that are of high, moderate, or even low potential for oil and gas resources.

The RMP/FEIS assumes a total of 448 wells would be drilled, including small and large field developments and associated abandoned well pads, resulting in total short-term disturbance of approximately 8,400 acres and a long-term (greater than 10 years for producing wells) disturbance of approximately 1,400 acres. Short-term disturbance, as defined for the RFFD scenario, identifies potential dry wells to be plugged and abandoned that would be reclaimed immediately after drilling or construction, in accordance with COAs and BMPs. If 448 wells should occur over 20 years, then an average of 22 wells totaling 420 acres of short-term surface disturbance and 70 acres of long-term surface disturbance can be expected per year under the RFFD scenario. Therefore, it is expected that 352 wells should have been drilled since the RMP. There have been 19 APDs approved by the Ely District over the past 10 years. Only 104 APDs have been approved in all of Nevada from 2012 to 2022. Most APDs in the Ely District propose a single well per pad. Additionally, not every APD approved is actually drilled. herefore, it would be highly speculative that the maximum number of wells in the RFFD scenario, 448 wells, would be drilled over the final four years of the RFFD scenario 20-year timeframe.

Exploration Drilling

The RFFD scenario in the Ely District RMP/FEIS (2007) planned for 200 exploration wells over the life of the RMP that could result in 740 acres of short-term surface disturbance. This exploration well estimate does not include numbers for small and large field development or abandoned well pads. Under the RMP scenario, approximately 1,000 miles of new roads would be created to access the well pads. This would add another 4,800 acres of short-term surface disturbance (BLM 2007, Table 4.18–2). If this development and associated disturbance is expected over the course of 20 years, then average development and disturbance per year is expected to include 10 exploration wells and 50 miles of new roads resulting in 37 acres and 240 acres of short-term surface disturbance respectively.

Typically, constructing the roads and pads, and drilling the well should take less than six months to complete. If the well is a dry hole, then it is plugged immediately before the drill rig leaves the site. Reclamation of the pad and access road takes place once conditions permit, typically within six months of abandoning the well. If the well becomes a producer, then the access road would remain until the well is no longer producing. The pad would be reclaimed to a smaller size necessary to accommodate production operations.

2.4.3. Production

The average geographic area for a producing oil and gas field in the United States is about 640 acres. Field sizes tend to be smaller in Nevada. There would be 40–acre spacing for wells less than 5,000 feet in depth and 160–acre spacing for wells deeper than 5,000 feet. Most wells drilled in Nevada are deeper than 5,000 feet, so well spacing would probably be 160 acres.

The RFFD scenario in the RMP/FEIS planned for six new production well fields within the Ely District; four small fields and two large fields. The four small well fields would be comprised of 88 wells, 40 being producing wells and the other 48 being plugged and abandoned. The two large well fields would be comprised of 160 wells, 100 being producing wells and the other 60 being plugged and abandoned. This RFFD also included a total of 56 miles of new access and service roads, and eight miles of new pipelines for the small well fields. The two large well fields would include an overall total of 55 miles of new

access and service roads, and 10 miles of new pipelines. A projection of adding a new refinery to the area was also included in this RFFD (BLM 2007, Table 4.18–2).

Well fields can take a number of years to develop and occupy various acreages. Therefore, it cannot be broken down into an average number of well field development per year. Furthermore, the Ely District only has one well field (located in Railroad Valley with only two producing wells). It is possible however, that some of the individual parcels nominated, individually or as adjacent leases, could support well field development.

2.4.4. Well Stimulation

Well stimulation may be used to enhance oil recovery of developed wells. Several methods of well stimulation could be used to increase the yield of a well. Hydraulic fracturing is the process of applying high pressure fluids to a subsurface formation via a wellbore, to the extent that the pressure induces fractures in the rock. These fractures allow the oil and gas to migrate, or flow, into the well. Without the fracturing of the formation, the oil and gas contained in the rock would be too tightly trapped to flow into the well. Development of hydraulic fracturing methods and the drilling technology in which it is applied (in particular, long wells drilled horizontally within zones of interest) have enabled production of oil and gas from tight formations formerly not economically feasible.

In order to mitigate potential environmental impacts from hydraulic fracturing methods, the following list of mitigation measures would be required. Additional NEPA review(s) would be conducted when an APD is submitted to determine the site-specific issues, the need for additional BMPs and COAs, and if hydraulic fracturing can be conducted without causing undue and unnecessary degradation per 43 CFR 3100.

Wells are cased multiple times and sealed with cement between the wellbore and the formation. Well integrity is tested throughout the process.

Drilling and hydraulic fracturing fluids would either be contained in a pit-less system (above ground tanks) or a lined pit. Cuttings could be contained in roll-off boxes for hauling to disposal or surface casing interval cuttings could be spread over the site during reclamation.

Hydraulic fracturing fluids may be returned to the surface as “flowback” or produced water when the well is tested or produced. All recovered fluids are generally handled by one of four methods: (1) underground injection; (2) captured in steel tanks and disposed of in an approved disposal facility; (3) treatment and reuse; or (4) surface disposal pits.

A detailed discussion of hydraulic fracturing is found in Appendix F

Chapter 3. Affected Environment and Environmental Effects

3.1. Analysis Process Overview

Since there is no specific project proposal at the time of a lease sale, likely effects are predicted based on the RFD scenario for Ely. The scenario combines current knowledge with future expectations, and technological advances, as well as standard assumptions. The process used is summarized in this section. This section describes the affected environment, specifically the existing or baseline conditions relevant to the resource, followed by a description of the environmental effects projected to result from the alternative(s). The ID Team considered all resources that various supplemental authorities require BLM to address in EAs, and others deemed appropriate for evaluation. If a resource is not present or would not be affected, the rationale is provided in Tables 3.1 and 3.2 (below), and the resource is not discussed further.

3.1.1. Methods and Assumptions

An oil and gas lease sale does not involve a specific project proposal, but rather is a first step in making certain lands available for future oil and gas development; therefore, a meaningful analysis of the differences between alternatives requires that the Proposed Action include assumptions based on current exploration and development trends and projections. The assumptions used in this analysis include scenarios which predict the number of wells and amount of surface disturbance likely to occur. Current technologies, methods, and requirements will be applied in the foreseeable future. This analysis also assumes that the Stipulations and Lease Notices are applied to the parcels as the resource requires per the RMP.

3.1.2. Affected Area and Degree of Effects

An EA must analyze and describe the affected area and degree of effects of the Proposed Action and alternatives on the quality of the human environment. 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 auctioning of parcels and issuance of oil and gas leases is strictly an administrative action. There would be no effects from issuing leases because leasing does not directly authorize ground disturbing activities; no authorization for surface disturbance would be granted. 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. Thus, a lease sale makes the offered parcels available in the affected area and degree of effects (occurring at a later time). This chapter addresses those in the affected area and degree of effects. Additional site-specific NEPA analysis, based on the project, would address effects of any future exploration, development, or production.

3.1.3. Time Period Considered

The time period considered in this analysis is ten years, 2024 to 2034. This represents the initial term for an oil and gas lease, which expires at that time if economic production has not been established. If there is a proposal to develop a lease parcel, then additional project- and site-specific NEPA analysis would consider effects for a time frame appropriate to that project.

3.1.4. Analysis Area

The term “Analysis Area” refers to the parts of the Bristlecone Field Office in which the lease parcels occur. It includes Lake Valley, Lincoln County, Nevada, where the lease parcels are located.

3.1.5. 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 3.1 outlines these elements. Other resources considered are shown in Table 3.2. Resources not present or not affected are not addressed further.

Table 3.1 and Table 3.2 below documents the issues evaluation or rationale for dismissal from analysis and identifies sections and appendices for analyzed issues:

Table 3.1 Resources Considered (Supplemental Authorities)

Resources	Not Present	Present/Not Affected	Present/May be Affected	Rationale
Air Quality and Climate Change			X	Analyzed in sections 3.2.1 and 4.3.1
Special Designation Management: ACEC, National Monument, Wild and Scenic Rivers	X			No Special Designation Management areas are located within the affected environment.
Cultural Resources			X	Analyzed in sections 3.2.2 and 4.3.2
Environmental Justice and Socioeconomics			X	Analyzed in sections 3.2.3 and 4.3.3
Soil Resources: Prime and Unique Farmlands			X	Prime and Unique Farmlands are not present in the lease parcel area. Otherwise, Soil Resources are analyzed in sections 3.2.4 and 4.3.4.
Floodplains	X			The lease parcel lies in a FEMA Zone D area indicating no flood risk analysis has been done and thus has an undetermined flood risk level. Ely GIS layers show the parcel to be in an area having a Flood Frequency Class of None and is shown on the Ely GIS layers to lie outside any zones that would require applying the 100-Year

Resources	Not Present	Present/Not Affected	Present/May be Affected	Rationale
				Flood stipulation. No further analysis necessary.
Forests/Woodland Products and Rangelands (Healthy Forest Restoration Act Only)			X	Analysis at the leasing stage is based off the RFFD due to uncertainty regarding future development that would occur. See Appendix J.
Human Health and Safety			X	Analyzed in section 3.2.5 and 4.3.5
Migratory Birds			X	Analyzed in sections 3.2.10 and 4.3.13
Native American Religious Concerns			X	Tribes invited to consultation and coordination, must be analyzed. Analyzed in sections 3.2.6 and 4.3.6
Non-Native Invasive and Noxious Species			X	Analysis at the leasing stage is based off the RFFD due to uncertainty regarding future development that would occur. See Appendix J.
Threatened or Endangered Species			X	Analyzed in sections 3.2.10 and 4.3.10
Wastes, Hazardous or Solid			X	Analyzed in sections 3.2.7 and 4.3.7
Water Resources: Surface and Ground			X	Analyzed in Sections 3.2.8 and 4.3.8
Wetland and Riparian Zones	X			The Natural Resources Conservation Service Web Soil Survey indicates the soils underlying the parcel location have no hydric soil rating. Under that criterion, in turn, the U.S. Fish and Wildlife Service does not consider the water regime of this area to fall under their definition of a wetland. No further analysis necessary.

Resources	Not Present	Present/Not Affected	Present/May be Affected	Rationale
Wilderness and Wilderness Study Areas (WSAs)	X			None of the proposed parcels are within a designated Wilderness or WSA
Lands with Wilderness Characteristics	X			None of the proposed parcels contain Lands with Wilderness Character.

Table 3.2 Resources Considered

Other Resources	Not Present	Present/Not Affected	Present/May be Affected	Rationale
Fire Management		X		Standard fire management stipulations would be included in any lease sale (see Appendix D).
Vegetation Resources			X	Analyzed in sections 3.2.9 and 4.3.9
Fish and Wildlife			X	Analyzed in sections 3.2.10 and 4.3.10
Special Status Species			X	Analyzed in sections 3.2.10 and 4.3.10
Wild Horse and Burro			X	Analysis at the leasing stage is based off the RFFD due to uncertainty regarding future development that would occur. See Appendix J.

Other Resources	Not Present	Present/Not Affected	Present/May be Affected	Rationale
Paleontological Resources		X		The Paleontological resources lease notice would be included in any lease sale. Analysis at the leasing stage is based off the RFFD due to uncertainty regarding future development that would occur. Paleontological Resources is not an issue and therefore is not analyzed in detail. Any potential impacts from subsequent exploration and development activities would be analyzed in additional, site-specific analysis.
Lands and Realty		X		No Rights of Way within proposed parcels. N-040130 (USGS water monitoring well - .5 miles away) in T. 07 N., R. 66 E., sec. 16, SWSE., LCPD Powerlines ~ 1 mile away from parcel.
Travel Management		X		Analysis at the leasing stage is based off the RFFD due to uncertainty regarding future development that would occur. Travel Management is not an issue and therefore is not analyzed in detail. Any potential impacts from subsequent exploration and development activities would be analyzed in additional, site-specific analysis.
Visual Resources Management			X	Analyzed in sections 3.2.11 and 4.3.11
Recreation			X	Analysis at the leasing stage is based off the RFFD due to uncertainty regarding future development that would occur. See Appendix J.
Livestock Grazing			X	Analyzed in sections 3.2.12 and 4.3.12

Other Resources	Not Present	Present/Not Affected	Present/May be Affected	Rationale
Mineral Resources			X	Analyzed in sections 3.2.13 and 4.3.13

3.2. Environmental Effects of Alternative A and Alternative B

This section describes the affected environment (i.e., the physical, biological, and socioeconomic values and resources) and environmental consequences to resources that could be affected by implementation of Alternative A – Proposed Action or Alternative B –is analysis is tiered to the Ely RMP for each geographic location of the nominated parcels, and the lease parcels included in each alternative are within areas that are open to oil and gas leasing in their respective RMP.

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.

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.

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.

3.2.1. Air Quality and Climate Change

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 3.3 Sources of Criteria Air Pollution in Lincoln County, 2020

Source Category	Criteria pollutants, tons per year	%
Wildfire	34,838	49.42%
Biogenics	28,632	40.61%
Industrial Processes other than Petroleum and Natural Gas	3,049	4.33%
Mobile Sources	2,078	2.95%
Fugitive Dust	1,034	1.47%
Agriculture	564	0.80%
Residential Fuel Combustion	120	0.17%
Waste Disposal	68	0.10%
Solvent Use	66	0.09%
Oil & Gas Midstream	47	0.07%
Commercial Cooking	2	0.00%
Commercial and Industrial Fuel Use	0	0.00%
Oil & Gas Production	0	0.00%
Total	70,499	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>

As shown in Table 3.3, wildfires, biogenic sources (natural processes and plants such as pine trees), and industrial processes were the source of more than 94% of the air pollution in Lincoln County 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. Table 3.4 presents 2020 HAP emission sources from the most recent NEI.

Table 3.4 Sources of Hazardous Air Pollution in Lincoln County, 2020

Source Category	tons per year	%
Wildfire	1,144	21.15%
Biogenics	4,217	77.94%
Industrial Processes other than Petroleum and Natural Gas	0	0.00%
Mobile Sources	29	0.53%
Fugitive Dust	0	0.00%
Agriculture	2	0.03%

Residential Fuel Combustion	5	0.10%
Waste Disposal	2	0.04%
Solvent Use	8	0.15%
Oil & Gas Midstream	4	0.07%
Commercial Cooking	0	0.00%
Commercial and Industrial Fuel Use	0	0.00%
Oil & Gas Production	0	0.00%
Total	5,410	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>

As shown in Table 3.4, wildfires, biogenic sources, and industrial processes were the major sources of HAPs in Lincoln County in 2020, accounting for 99% of total emissions. Tables 3.3 and 3.4 show that Oil & Gas Production, other oil and gas operations, and petroleum-based fuel use in mobile sources (cars, trucks and construction equipment) combined are the source of only about 3% of air pollution in Lincoln County.

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.

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 AQI daily 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. Air monitoring data and daily AQIs are available for White Pine County near the proposed lease as shown in Table 3.5. AQI data shows air quality is generally good within the analysis area and that there is little risk to the public from poor air quality based on available data for the most recent 5-year period (2018-2022).

Table 3.5 Ely District Air Quality as shown by AQI, 2018 - 2022

5-Year Avg Good Days per year		5-Year Avg Moderate Days per year		Unhealthy for Sensitive Groups Days per year		5-Year Avg Unhealthy Days per year		Very Unhealthy Days	Hazardous Days
283.6	79.0%	73.2	20.4%	2.4	0.7%	0.0	0.0%	0.0	0.0

Source - AQI by County data downloaded from https://aqs.epa.gov/aqsweb/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 effect 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

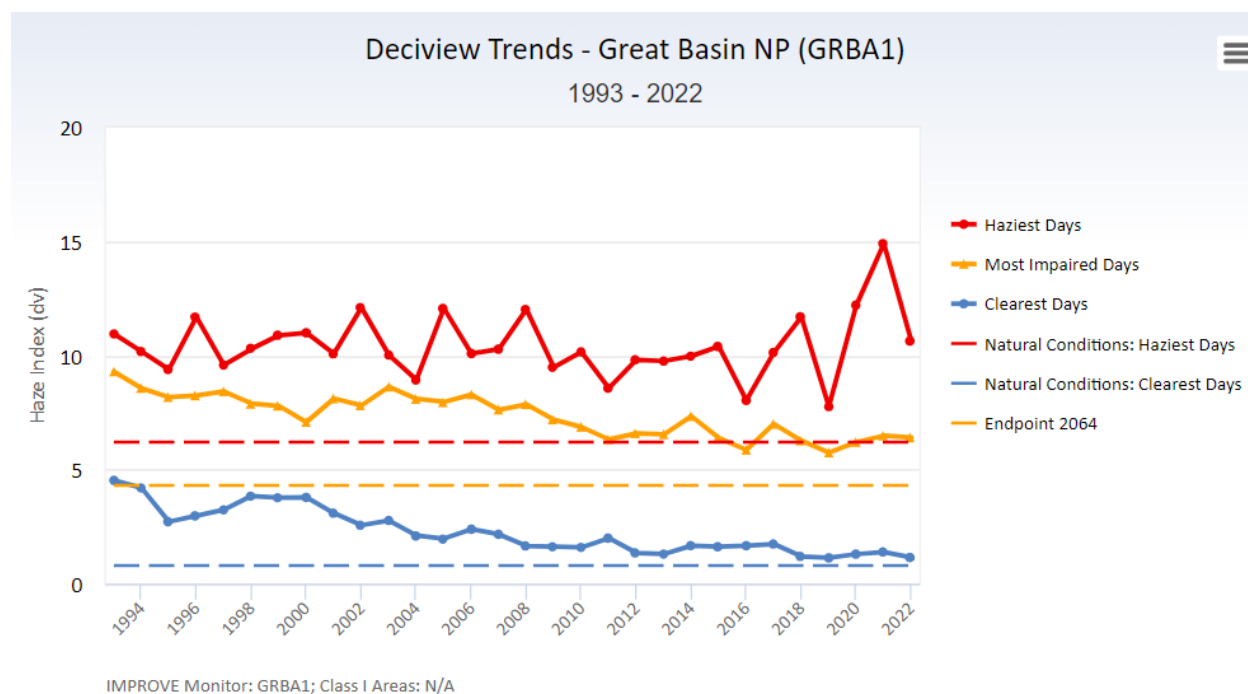
specific AQRV protection under the CAA. There are no Class I areas in or adjacent to the analysis area. The nearest Class I areas is Zion National Park, approximately 118 miles southeast of the lease parcel.

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.

The Great Basin National Park (GBNP), located approximately 30 miles north northeast of the proposed lease sale parcel, 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.

Figure 1. Air quality at Great Basin National Park



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. Industrial sources such as power plants, mines, and oil and gas extraction activities in Nevada contribute to local and regional air pollution. It is unknown if the parcels would be sold and developed, or the extent of development, so it is not feasible to quantify potential air quality effects via methods such as dispersion modeling. Table 3.6 presents estimated criteria pollutant and HAP emissions related to well development and operations as well as transportation, processing, and end use of potential production for the reasonably foreseeable development scenario as it has played out in the past decade. As shown in the table, maximum estimated criteria pollutant emissions related to the lease sale would represent approximately 0.2% of 2020 criteria emissions in the Ely District. This small increase in emissions would not be expected to cause a discernable change in air quality.

Table 3.6 Estimated Maximum Annual Emissions related to Well Development, Production Operations, Mid-stream, and End-use with context

Activity	PM ₁₀	PM _{2.5}	VOC	NO _x	CO	SO ₂	HAPs
	tons per year	tons per year	tons per year	tons per year	tons per year	tons per year	tons per year
Well Development	22.0	3.1	3.1	28.7	16.0	1.7	0.2
Production Operations	11.8	1.3	62.8	2.7	3.8	0.0	7.4
Mid-Stream¹	0.3	0.2	3.4	3.1	1.9	0.9	0.3
End-Use^{2,4}	0.9	0.2	6.2	2.2	74.0	0.1	0.6
Total	35.1	4.9	75.5	36.7	95.6	2.6	8.5
Context							
Ely District - 2020 Totals³	10,884	3,911	51,853	4,364	43,502	304	10,334
Nevada - 2020 Totals³	113,48	26,720	262,92	68,269	403,22	981	56,646

1 - Midstream emissions include transportation, processing and supply-chain emissions estimated by the GREET WTW Calculator as Well to Pump (WTP) emissions. These emissions come largely from facilities that hold 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 Ely District (White Pine and Lincoln 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, older developments in existing Nevada oil fields, with similar equipment, access roads, and infrastructure. Historically 90% of exploration wells in Nevada result 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 3.6 are conservative and represent a total of 20 wells drilled during the 10-year lease period, with two (2) of those wells coming into production.

Design Constraints

The BLM does look to 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 on air quality. At the APD stage, further conditions of approval 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.

GHGs and Climate Change

Any subsequent 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 activities occurring on the leased parcels, and from the consumption of any fluid minerals 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, and production, abandonment operations, product transportation, and potential regulatory changes over the 10-year primary lease term. Actual development on a lease is likely to vary from what is analyzed in this EA and will be evaluated through a site-specific NEPA analysis when an operator submits an APD or plan of development to the BLM.

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>.

Affected Environment

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.

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 1 shows the total estimated GHG emissions from fossil fuels at the global, national, and state scales over the last six 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 3.7 Global and U.S. Fossil Fuel GHG Emissions 2015 - 2021 (Mt CO₂/yr)

Scale	2016	2017	2018	2019	2020	2021
Global	36,465.6	36,935.6	37,716.2	37,911.4	35,962.9	37,500.0
U.S.	4,909.9	54,852.5	4,989.8	4,855.9	4,344.9	4639.1
Nevada	43.5	43.3	44.8	45.4	40.8	43.5

Source: 2016-2020 - Annual GHG Report, Chap. 5, Table 5-1 (Global and U.S.) and Table 5-2(State). 2021 - <https://www.epa.gov/system/files/other-files/2023-02/State-Level-GHG-data.zip>

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 lease sale. There are four general phases of post-lease development that would generate both direct (on-lease) and indirect (downstream) GHG emissions. Direct emissions would result from well development (well site construction, well drilling, and well completion), and well production operations (extraction, separation, gathering), while downstream emissions would result from mid-stream (refining, processing, storage, and transport/distribution), and end-use (combustion or other uses) of the fluid minerals produced. BLM has program authority for on-lease well development and production operations but no authority for off-lease operations including mid-stream and end-use.

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 would 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 6, Table 6-8 and 6-10).
- 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 6).

Table 3.2 lists the estimated direct (well development and production operations) and indirect (mid-stream and end-use) GHG emissions in metric tonnes (t) for the subject leases over the average 30-year production life of the lease. In summary, potential GHG emissions from the Proposed Action could result in GHG emissions of 200,615t CO₂e over the life of the lease.

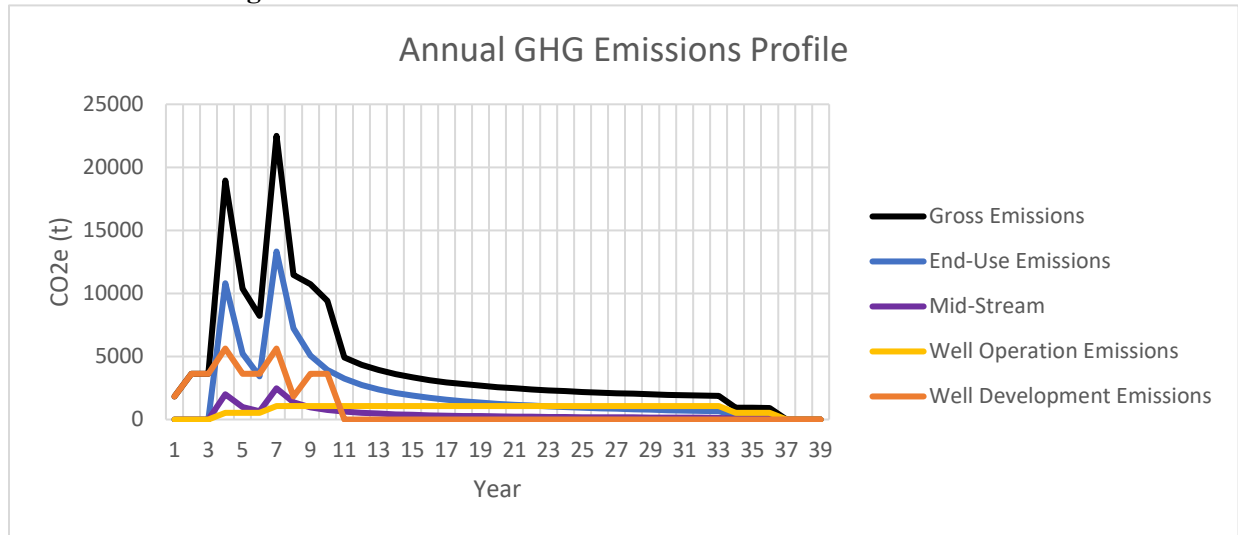
Table 3.8. Estimated Life of Lease Emissions from Well Development, Production Operations, Mid-stream, and End-use (metric tonnes)

Activity	CO ₂	CH ₄	N ₂ O	CO ₂ e (100-yr)	CO ₂ e (20-yr)
Well Development	29,357	244.73	0.178	36,698	49,595
Production Operations	22,583	316.69	0.057	32,036	48,725
Mid-Stream	12,342	105.82	0.188	15,547	21,123
End-Use	80,849	2.48	0.429	81,040	81,171
Total	145,131	669.72	0.852	165,321	200,615

Source: BLM Lease Sale Emissions Tool

GHG emissions vary annually over the production life of a well due to declining production rates over time. Figure 2 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.

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



Source: BLM Lease Sale Emissions Tool

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. The EPA GHG equivalency calculator (EPA , 2022) can be used to express the potential average year GHG emissions on a scale relatable to everyday life (<https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>). For instance, the projected average annual GHG emissions from potential development of the subject lease are equivalent to 1,571 gasoline-fueled passenger vehicles driven for one year, or the emissions that could be avoided by operating 2 wind turbines as an alternative energy source or offset by the carbon sequestration of 8,678 acres of forest land.

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. These numbers were monetized; however, they do not constitute a complete cost-benefit analysis, nor do the SC-GHG numbers present a direct comparison with other impacts analyzed in this document. SC-GHG is provided only as a useful measure of the benefits of GHG emissions reductions to inform agency decision-making. For Federal agencies, the best currently available estimates of the SC-GHG are the interim estimates of the social cost of carbon dioxide, methane, and nitrous oxide developed by the Interagency Working Group (IWG) on the SC-GHG.

Table 3.9 presents the SC-GHGs associated with estimated emissions from future potential development of the lease parcels. The IWG’s SC-GHG estimates are based on complex models describing how GHG emissions affect global temperatures, sea level rise, and other biophysical processes; how these changes affect society through, for example, agricultural, health, or other effects; and monetary estimates of the market and nonmarket values of these effects. One key parameter in the models is the discount rate, which is used to estimate the present value of the stream of future damages associated with emissions in a particular year. 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). The current set of interim estimates of SC-GHG have been developed using three different annual discount rates: 2.5%, 3%, and 5% (IWG 2021).

To address uncertainty in the estimates, the IWG recommends reporting four SC-GHG estimates in any analysis. Three of the SC-GHG estimates reflect the average costs from the multiple simulations at each of the three discount rates. The fourth value represents higher-than-expected economic impacts from climate change. Specifically, it represents the 95th percentile of impacts estimated, applying a 3% annual discount rate for future economic effects. This is a low probability, but high impact scenario, and represents an upper bound of impacts within the 3% discount rate model.

The estimates below follow the IWG recommendations and represent the present value (from the perspective of 2021) of future market and nonmarket costs associated with CO₂, CH₄, and N₂O emissions from potential well development and operations and potential end-use. Estimates are calculated based on IWG estimates of social cost per metric ton of emissions for a given emissions year and BLM's estimates of emissions in each year, rounded to the nearest \$1,000.

Table 3.9. SC-GHGs Associated with Future Potential Development

	Social Cost of GHGs (2020 \$)			
	Average Value, 5% discount rate	Average Value, 3% discount rate	Average Value, 2.5% discount rate	95th Percentile Value, 3% discount rate
Development and Operations	\$933,000	\$3,193,000	\$4,722,000	\$9,358,000
Mid-Stream and End-Use	\$1,174,000	\$4,440,000	\$6,723,000	\$13,382,000
Total	\$2,107,000	\$7,633,000	\$11,445,000	\$22,740,000

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 resulting from new Federal oil and gas development would occur 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.

3.2.2. Cultural Resources

Affected Environment

Cultural resources include, but are not limited to, rock art; utilized rock shelters and caves; prehistoric habitation sites, camp sites, and specialized activity areas; and historic cemeteries, mines, town sites and dwellings. The cultural landscape on the Ely District provides evidence of a long history of human occupation. The earliest commonly accepted time frame for human presence in Nevada is approximately 10,000 to 11,000 years before present. The region has been consistently, though not densely, populated up to the present day.

The Lake Valley parcel being analyzed for lease under this EA has not been surveyed. However, cultural resource sites are known within two miles of the parcel. In general, the prehistoric and historic cultural landscape in these valleys includes artifacts, features, and sites. These evidence classes relate to cultural affiliation; prehistoric technology, subsistence systems, and settlement patterns; and historic mining, ranching, and agriculture.

Environmental Effects

Any project has an effect on cultural resources if the project alters any of the characteristics or criteria that may qualify a cultural property for inclusion on the National Register of Historic Places (NRHP) or otherwise affects a cultural property's legally protected status. Impacts to cultural properties are considered adverse if the effect diminishes the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Negative or adverse effects can include, but are not limited to, the following: physical destruction of, or damage to, all or part of a property; alteration of a property (e.g., restoration, rehabilitation, stabilization); removal of a property from its historic location; or, transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation (2008 Ely District RMP).

Proposed Action

The Proposed Action to lease oil and gas parcels does not entail ground disturbing activities as part of the undertaking. Therefore, this undertaking would not result in direct impacts to cultural resources.

All Lease Sale parcels will come with a Notice of possible National NRHP-eligible sites present and mandate an additional site-specific EA, including NHPA Section 106 compliance, before any ground disturbance is authorized. This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act (AIRFA), Native American Graves Protection and Repatriation Act (NAGPRA), Executive Order 13007, or other statutes and executive orders. The BLM will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations, including Tribal consultation and consultation with the State Historic Preservation Officer (SHPO). The BLM may 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 not impact cultural resources. Activities would remain on-going as permitted on surrounding federal, state, and private lands.

3.2.3. Environmental Justice and Socioeconomics

Environmental Justice

The BLM defines environmental justice as “the fair treatment and meaningful involvement of all potentially affected people regardless of race, color, national origin, or income. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic groups should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.”

In 1994, President Bill Clinton issued EO 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations), which requires federal agencies to consider EJ as part of their mission. The EO’s intent is to promote fair treatment of people of all races and income levels, so no person or group of people bear 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 “disproportionately high adverse human health and environmental effects on minority populations and low-income populations.” The purpose of this EJ assessment is to determine if low-income, minority, and Tribal populations are likely to be adversely and disproportionately affected by the sale of this lease. This assessment describes the environment that may be affected from an EJ perspective, the regulatory framework that guided the EJ assessment, and the expected effects on EJ communities.

Affected Environment

The primary guidance for implementing EJ assessments at the federal level is the CEQ, which was prepared in response to EO 12898 and outlines principles for EJ analysis; this guidance is often supplemented by the Federal Interagency Working Group on Environmental Justice and NEPA Committee (2016), which provides additional guidance on how to identify minority populations and identifies and discusses a range of potential approaches to EJ assessments (CEQ 1997; Federal Interagency Working Group on Environmental Justice and NEPA Committee 2016). Table 3.10 summarizes the data used to identify EJ communities. Data are provided for the 11 census block groups that make up the MFO. Because these block groups are all in White Pine and Lincoln counties, Nevada State non-metro thresholds are used to provide context and comparison. The population in the study area totals 9,481. The reference area is Nevada State non-metropolitan counties. The project block group location is Census Block Group (BG) 320179501002.

EJ communities were identified using methodology established in the BLM’s guidance and data compiled by the U.S. Census Bureau. This method is summarized as follows:

- Any block group is considered a low-income community of concern if 1) the population experiencing poverty in one or more study area geographies are near, at, or below 200% of the federal poverty threshold of the reference area OR 2) if the population of the community experiencing poverty is at or above 50%.
- Any block group is considered a minority community of concern if the percentage of the population self-identifying as other than “white alone, not Hispanic” in a study area is 1) equal to or greater than 50% of the population OR 2) meets the “meaningfully greater” threshold. Meaningfully greater is calculated by comparing the minority group population percentage with 110% of the reference area minority population.

- Any block group where the proportion of the population self-identifying as American Indian or Alaska Native Alone or in Combination with One or More Other Races exceeded the same measure for Nevada State non-metro threshold was identified as an EJ community of concern due to the presence of Native Americans.

Table 3.10: EYDO FY24 Q2 O&G Lease Sale Environmental Justice Study Area Block Group Data

Block Group	Description (ST, County, Key Relative Locations)	Low Income #	Minority #	Tribal #
320179501001	NV, Lincoln Co., Ninemile Rocks	26.3 percent	7.1 percent	6.2 percent
320179501002	NV, Lincoln Co., Lease Area, Lake Valley	35.2 percent	56.6 percent	1.5 percent
320179501003	NV, Lincoln Co., Schell Creek Range	39.1 percent	0.0 percent	0.0 percent
320339701001	NV, White Pine Co.	38.4 percent	19.2 percent	19.2 percent
320339701002	NV, White Pine Co., McGill	12.1 percent	25.4 percent	11.8 percent
320339702001	NV, White Pine Co., Ely	11.4 percent	23.1 percent	4.2 percent
320339702002	NV, White Pine Co., Ely	34.9 percent	31.0 percent	15.0 percent
320339702003	NV, White Pine Co., Egan Range	26.1 percent	13.2 percent	0.0 percent
320339703001	NV, White Pine Co., Ely	43.1 percent	11.1 percent	0.0 percent
320339703002	NV, White Pine Co., Ely	32.2 percent	38.1 percent	1.0 percent
320339703003	NV, White Pine Co., Ely	29.8 percent	9.4 percent	1.1 percent
BG Totals		27.0 percent	21.9 percent	5.9 percent
Reference area ^# (See above)		28.1 percent	28.8 percent 31.7 percent MGA	4.7 percent

Data sources:

- ^ Headwaters Economics BLM EPS and SEP: <https://headwaterseconomics.org/tools/blm-profiles/>
- # American Community Survey: <https://data.census.gov/cedsci/table>

Low-income environmental justice populations are identified in the analysis area. It is estimated that 27.0 percent of the analysis area population meet or exceed the low-income threshold, including the lease area and adjacent block groups. Seven census block groups within the analysis area had low-income populations that met this criterion including:

- BG 320179501002 NV, Lincoln Co., Lease Area, Lake Valley
- BG 320179501003 NV, Lincoln Co., Schell Creek Range
- BG 320339701001 NV, White Pine Co.
- BG 320339702002 NV, White Pine Co., Ely
- BG 320339703001 NV, White Pine Co., Ely
- BG 320339703002 NV, White Pine Co., Ely
- BG 320339703003 NV, White Pine Co., Ely

Minority environmental justice populations are identified in the analysis area. It is estimated that 21.9 percent of the analysis area population meet or exceed the minority meaningfully greater threshold. Three census block groups within the analysis area had minority populations that met this criterion including:

- BG 320179501002 NV, Lincoln Co., Lease Area, Lake Valley
- BG 320339702002 NV, White Pine Co., Ely
- BG 320339703002 NV, White Pine Co., Ely

All three minority-identified block groups also meet low-income environmental justice thresholds.

American Indian and/or Alaska native Tribal environmental justice populations are identified in the analysis area. It is estimated that 5.9 percent of the analysis area population meet or exceed the Tribal threshold. Five census block groups within the analysis area had American Indian and/or Alaska native populations that met this criterion including:

- BG 320179501001 NV, Lincoln Co., Ninemile Rocks
- BG 320339701001 NV, White Pine Co.)
- BG 320339701002 NV, White Pine Co., McGill
- BG 320339702001 NV, White Pine Co., Ely
- BG 320339702002 NV, White Pine Co., Ely

Two of these BGs also exceed low-income thresholds (BG 320339701001 and BG 320339702002). Block group 320339702022 exceeds low-income, minority, and Tribal thresholds.

Environmental Effects

Proposed Action

As stated above, all three types of EJ populations are known to exist within the leasing area. For this reason, anticipated site development and production on leases would require additional EJ assessments to determine potential site-specific effects impacts on EJ communities. The purpose of leasing parcels to oil and gas companies is eventual development, therefore, impacts to EJ communities are expected. Any impacts to minority or low-income populations, will be evaluated on a project-specific basis by the local BLM Field Office, which is better positioned to understand local communities including low-income and minority populations. Under the proposed action, the BLM would offer one parcel for lease, allowing for potential oil and gas development on this land.

As noted above, 10 of the 11 block groups in the analysis area meet or exceed environmental justice thresholds (four of the 11 meet or exceed more than one threshold). Oil and gas exploration and development may disproportionately and adversely impact environmental justice community members. Environmental justice community members may lack the financial means to relocate and/or self-adjust to said impacts. Moreover, they may be bound to place though cultural, linguistic, and familial ties that make relocation difficult.

Oil and gas development is often associated with localized increases in air emissions and dust. Exploration, drilling, and/or production may also inconvenience people through increased traffic, noise, and visual impacts. The creation of new access roads could increase public access to public and private lands. Environmental justice communities are more sensitive to increased public access and associated environmental degradation and/or vandalism, in addition to being more sensitive to and/or less able to mitigate traffic delays, noise, and viewshed degradation.

Environmental justice communities are disproportionately impacted by the effects of a warming climate. The development of the leases could lead to an increase in global GHG concentrations, which in turn increases global temperatures, and EJ communities may be adversely and disproportionately affected. These impacts would be particularly noticeable in rural areas where oil and gas development has not occurred previously.

Although access to open and quiet areas to recreate is not one of the criteria that identify EJ communities, research shows that EJ communities experience disproportionate barriers to experience outdoor recreation and safe housing, further exposing them to impacts of climate change. These barriers are caused by

historical discrimination and economic disadvantages related to systemic oppression, which are caused by cultural, personal, and other forms of discrimination. These disadvantages lead to a higher chance of being exposed to air and water contaminants, while not having access to resources to adapt or overcome these challenges.

No Action Alternative

Under the No Action Alternative, the BLM would not offer the parcel for sale. The decision would not disproportionately or adversely impact environmental justice communities within the analysis area. Activities on currently leased parcels adjacent to the proposed parcels would remain on-going as permitted on surrounding federal, state, and private lands.

Socioeconomics

The socioeconomic analysis area is both Lincoln and White Pine counties, NV. Existing conditions in the counties are characterized using data obtained from the U.S. Department of Labor, the U.S. Geological Survey Gap Analysis Program, the Bureau of Labor Statistics, local area unemployment statistics, the U.S. Department of Commerce, and the U.S. Census Bureau, as compiled by the Headwaters Economics Socioeconomic Profiles Tool developed for the BLM.

Affected Environment

Land Ownership

There are 12,501,044 total acres in the analysis area. Table 3.11 describes the analysis area's land ownership and management allocations.

Table 3.11: Land Ownership in EYDO FY24 Q2 O&G Lease Sale Socioeconomic Analysis Area (and % of total)

	Lincoln County, NV	White Pine County, NV
Total Land	6,807,789	5,693,255
Federal Land	6,658,164 (97.8%)	5,369,792 (94.3%)
BLM	5,581,253 (82.0%)	4,515,194 (80.8%)
Other Federal (USFS, DOD, NPS etc).	1,076,911 (15.8%)	1,931,509 (15.5%)
Tribal Land	0 (0.0%)	70,488 (1.2%)
Private Land	142,447 (2.1%)	245,145 (4.3%)
State and Local Land	7,178 (0.1%)	7,831 (0.1%)

In fiscal year 2019, a total of \$3,452,725 (2022 dollars) was paid by federal land management agencies to state and local governments. Of those payments, \$2,529,584 (73.3%) was payments in lieu of taxes (PILT) and \$310,449 (9.0%) was from the BLM. Payments from the BLM were higher in the analysis area than in the reference area (7.7%) suggesting the potential for greater reliance on federal payments to analysis area economies.

Population Demographics, Employment, and Income

The total population in the analysis area in 2022 was 13,270, representing an increase of 0.5% from 2000 to 2022. Natural changes such as births and deaths were the largest contributor to this change in population. Low growth rates such as this are often indicative of communities with stagnant economic profiles and / or communities lacking sufficient social, environmental, or financial inducement to

motivate in-migration. The 13,270 residents of the analysis area are dispersed over 12.5 million acres. This equates to a population density of 0.001 person per acre.

In 2022 there were a total of 7,974 jobs in the analysis area. Nearly 70 percent of these jobs were in White Pine County, NV. In that same year, the average annual unemployment rate in the analysis area was 3.3 percent. Approximately 2,329 analysis area jobs were in non-service industries; nearly 65 percent of these jobs were mining/fossil fuels-related industries and in White Pine County, NV.

Per capita income in the analysis area in 2022 was \$54,366 (in 2022 dollars). This is less than the Nevada non-metro reference area (\$58,259), further indicating a less-than-robust economic landscape in the analysis area. In 2022, 8.5 percent of the analysis area were below the federal poverty level. Within the analysis area the average annual wage in 2022 for all reported jobs was \$61,598, which is less than the Nevada non-metropolitan average annual wage (\$62,759).

Non-labor income, which includes dividends, interest payments, rent, age-related transfer payments, hardship-related payments, and other transfer payments, can be important in local economies. Where non-labor income is a relatively high percentage of all income, it is likely that there are a higher number of retirees in comparison to other regions. In 2022, total non-labor income within the analysis area represented 38.6 percent of all income, which is significantly less than the reference area (43.1 percent). The majority of non-labor income in the analysis area was divided between rents/dividends and age-related transfer payments.

Environmental Effects

Although leasing itself would not directly authorize any oil and gas development or production, future oil and gas development or production are a reasonable outcome of a leasing decision. Should an APD be received for a lease, the BLM will conduct additional site-specific NEPA analysis for socioeconomic conditions before deciding whether to approve an APD and what COAs should apply. Because leasing can lead to development, this assessment incorporates an analysis of the potential development of leases under both alternatives.

Economic effects are typically measured in direct, indirect, and induced impacts. Direct impacts measure the economic impact of operating expenditures made by one or more economic enterprises within the study area on labor, materials, supplies, and productive capital. Indirect effects measure the purchase of goods and services, and the hiring of labor to meet demand for inputs that are purchased within the study area in support of the economic activities accounted for in the direct impacts described above. Induced effects measure the economic impact that occurs because of household purchases of goods and services by employees of the economic enterprise(s) accounted for in direct impacts. Induced effects do not represent cumulative effects.

Lease development usually occurs in four phases: implementation, drilling operations, production, and reclamation. Each of these phases may directly impact socioeconomic conditions in the analysis area, as indicated via the creation of jobs, straining public services, increases in income, and generation of tax revenues.

Before the implementation phase, pre-drilling exploration work occurs, which is usually performed by in-house technicians employed by oil and gas companies; however, local contractors could be employed in activities that may follow the pre-drilling exploration, such as work associated with the implementation phase. The implementation phase could include activities such as pad construction, development of new access roads or upgrading existing roads, and the installation of pipelines. Drilling time could vary depending on well depth and complexity; therefore, the drilling could last from a few days to a week. Outside workers could also spend money in local or regional economies for the duration of their work,

positively contributing to local revenue. Similarly, outside workers represent a potential strain on local public services – especially in predominantly rural counties where access to health care, grocery shopping, housing, education, and law enforcement services can be limited.

Activities during the production phase would involve the addition of specialized machinery such as engines for pumping oil, compressors for moving gas through pipelines, and vents for storage tanks. Additionally, trucking companies could be hired locally to haul produced fluids to and from the wells and technicians would perform routine monitoring and checks of the wells. In-house scientists would likely be used to perform monitoring work, but qualified local drivers could be contracted for transportation of materials.

The reclamation phase includes plugging wells and reclaiming the well pads and other associated structures that caused disturbances, such as roads and pipelines. As with the implementation phase, local contractors may be hired to perform construction activities associated with plugging and reclamation of wells.

During each of these phases, the potential for economic impacts exists. Direct project spending on locally sourced labor and capital could stimulate the economy, resulting in both indirect and induced economic activity. As noted above, at each of these phases it is possible that project employment could exacerbate already reduced public service access issues. Payments made at the time of auction, annual rental fees, and royalties (when and if production does occur) would provide revenue to county governments.

Proposed Action

The purpose of leasing parcels to oil and gas companies is eventual development; therefore, impacts to socioeconomic communities are expected. Under the proposed action, the BLM would offer one parcel for lease, allowing for potential oil and gas development on this land.

For fiscal year 2022 the Ely District Office reported that oil and gas activities in their district resulted in six direct jobs and nine indirect or induced jobs. Direct labor income from that activity amounted to approximately \$49,000. Indirect and induced labor income netted approximately \$636,800 dollars. The data suggests that new oil and gas production could support 0.24 direct jobs per Mbbl of oil and \$75,300 per Mbbl of oil in direct output where output is defined as the market value of production of a good or service. Further social and economic impact analysis should occur if and when the lease moves toward production to determine the full spectrum of socioeconomic impacts.

No Action Alternative

Under the No Action Alternative, the BLM would not offer the parcel for sale. The decision would not impact the socioeconomic landscape of communities within the analysis area. Activities on currently leased parcels adjacent to the proposed parcels would remain on-going as permitted on surrounding federal, state, and private lands.

3.2.4. Soils

Affected Environment

Soils in the analysis area around parcel NV-2024-06-2007 are of the Teebone-Yobe association (soil map unit 2030), which underlie the parcel on the Lake Valley Hydrographic Basin floor (NRCS, 2024). Both the Teebone and Yobe soils are formed from lacustrine deposits derived from mixed rock sources, are not rated as hydric soils, and are listed in the Sodic Terrace 8-10" Precipitation Zone Rangeland Ecological Site Description (NRCS, 2004). Within these Rangeland Ecological Sites, slopes most commonly range

from 0 to 4 percent with low permeability soils supporting black greasewood, basin big sagebrush, and basin wildrye as the dominant vegetation species. The Teebone and Yobe soils have slow water intake rates and a moderate to high water holding capacity but are designated as Hydrologic Group C soils, indicating they have a moderately high runoff potential when fully wet ([NRCS, 2007](#)).

Environmental Effects

Proposed Action

Future exploration and development on any leased parcels could affect soils. These might include activities such as seismic studies, exploratory drilling, production well development, 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.

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 presented. Through this process, specific mitigation measures and BMPs would be attached as COAs for each proposed activity.

Concurrent reclamation would be completed for all producing well locations, which would provide improved soil stability onsite and control of any soil erosion that may take place. Native vegetation would be restored during concurrent reclamation, partially restoring the site's vegetative productivity. As for final reclamation, sufficient topsoil would be maintained and native seed would be used, allowing the site to be restored to its original landform and restoring the site's full vegetative productivity.

No Action Alternative

The No Action Alternative would create no additional impacts to soils in the analysis area outside that occurring under current management. Activities on areas adjacent to the proposed parcels would remain on-going as permitted on surrounding federal, state, and private lands.

3.2.5. Human Health and Safety

Affected Environment

Public Health and Safety Affected environment information on Public Health and Safety can be found in the Ely District Proposed RMP in section 3.2.1. Relevant analysis on Air Quality can be found in section 3.2.0 of this EA. Additional analysis can be found in the [2021 BLM Specialist Report on Annual Greenhouse Gas Emission and Climate Trends](#)

Environmental Effects

Proposed Action

Future potential development of the nominated lease parcels would result in emissions of air pollutants that could lead to human health effects depending on the level and duration of exposure. 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 and may result from either chronic (long-term) and/or acute (short-term) exposure, and/or adverse environmental effects. Breathing 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 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.

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

Criteria Pollutants:

- Ozone (<https://www.epa.gov/ground-level-ozone-pollution>) (EPA 2022a)
- Particulates (<https://www.epa.gov/pm-pollution/particulate-matter-pm-basics>) (EPA 2022b)
- Nitrogen dioxide (<https://www.epa.gov/no2-pollution/basic-information-about-no2>) (EPA 2022c)
- Carbon monoxide (<https://www.epa.gov/co-pollution/basic-information-about-carbon-monoxide-co-outdoor-air-pollution#Effects>) (EPA 2022d)
- Lead (<https://www.epa.gov/lead-air-pollution/basic-information-about-lead-air-pollution#health>) (EPA 2022e)
- Sulfur dioxide (<https://www.epa.gov/so2-pollution/sulfur-dioxide-basics#effects>) (EPA 2022f)
- Hazardous air pollutants (<https://www.epa.gov/haps/health-effects-notebook-hazardous-air-pollutants>) (EPA 2021a)

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 2022h).

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 air quality 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). 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.
- All well pads, vehicles, and other workplaces must comply with worker safety laws as stipulated by the Occupational Safety and Health Administration (OSHA).
- Vehicular traffic and pipelines are regulated according to safety laws as stipulated by the Department of Transportation.
- Measures to lower risks related to hydrogen sulfide exposure include flaring or venting gas and the use of stock tank vapor recovery systems.

No Action Alternative

Under the No Action Alternative, no parcels would be offered for sale, therefore, no effects to human health and safety would be affected. Activities on currently leased parcels adjacent to the proposed parcels would remain on-going as permitted on surrounding federal, state, and private lands.

3.2.6. Native American Religious and other Concerns

Affected Environment

The boundaries of the Ely District encompass the traditional homelands of Western Shoshone, Goshute, and Southern Paiute Tribes. Ethnographic research and oral tradition confirm that these groups have utilized the resources and land since time immemorial and continue to do so. Modern descendant communities include the Duckwater Shoshone Tribe, the Ely Shoshone Tribe, Shoshone-Paiute Tribes of the Duck Valley Indian Reservation, Te-Moak Tribe of Western Shoshone, Yomba Shoshone Tribe, the Moapa Band of Paiute Indians of the Moapa River Indian Reservation, Las Vegas Paiute Tribe, the Confederated Tribes of the Goshute Reservation, and the Paiute Indian Tribe of Utah. Geographic proximity is just one of many factors that contribute to the interest a tribe may have in a particular area.

As such, letters were sent throughout Nevada and Utah, including the Intertribal Council of Nevada which links the leaders of all of Nevada's federally recognized Tribes.

Environmental Effects

The main concern consistently identified by Tribes is the protection of and access to natural, medicinal, and sacred resources, traditional use areas, and sacred sites. Each tribe also maintains a general concern for the welfare of plants, animals, air, landforms, and water. Tribal governments emphasize the health, safety, and prosperity of their members and seriously evaluate the socioeconomic impacts of projects near their communities. Specific information regarding resources, sacred sites, and features on the landscape, shared by Tribal representatives during consultation, are confidential.

Proposed Action

The lease parcel is located in Lake Valley, northern Lincoln County, Nevada. The BLM invited consultation and coordination with the above Tribes to identify any sites of concern (see Consultation and Coordination, Chapter 5). No specific concerns have been identified to date, however, the opportunity for Tribes to engage and identify concerns through consultation are on-going.

No Action Alternative

Under the No Action Alternative, the parcel would not be offered for sale, therefore, no effects to areas of tribal interest would be affected. Activities lands adjacent to the proposed parcels would remain on-going as permitted on surrounding federal, state, and private lands.

3.2.7. Wastes, Hazardous and Solid

Affected Environment

The nominated lease parcel is located in a rural area and are not adjacent to any school or population centers. There are currently no facilities/built environments or activities occurring within the parcel that would result in impacts related to hazardous and solid waste generation.

Environmental Effects

Proposed Action

Under the Proposed Action to lease parcels, no ground disturbing activities would occur and therefore no impacts relative to hazardous or solid waste would occur. However, the Proposed Action to lease the parcel for oil and gas activities including exploration drilling, extraction, production facilities, pipeline transport, and tanker loading, unloading and transport, has the potential to affect the environment through production of waste fluids, emissions and site impacts resulting from field development and related infrastructure. Oil spills, produced waters, drill fluids/cuttings, and hazardous materials could be encountered at a facility or drill pad. Under any alternative, all appropriate statutes, regulations and policies (see Section 1.7) and Gold Book standards, guidelines and BMPs would be applied.

The RFFD predicts that approximately 200 exploration wells would be drilled in the District primarily within the Bristlecone Field Office in the next 10 years, of which 40 would continue into development and production phases. Refer to Section 2.4 of this document for more detail regarding the RFFD for the Ely District.

Examples of indirect (future) environmental impacts from hazardous materials, hazardous waste, and solid waste which might be encountered during each phase are provided below. However, most of these incidental impacts, if not all, can be avoided or lessened through proper inspection and maintenance.

Exploration: Impacts 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. Accidental releases from reserve pits or wastewater collection systems could include hazardous water treatment chemicals such as chlorine. Also, stormwater 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. Stormwater runoff containing heavy metals and volatile organic compounds (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, impacts 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.

Impacts of any hazardous waste spills in areas with water resources would be potentially substantial and difficult to mitigate. The CSU Water Resources stipulation would require avoiding impacts within 500 feet of surface waters and riparian areas; impacts within 100 feet of ephemeral streams; and impacts to floodplains and playas. Application of this stipulation would not only prevent surface disturbance within the defined areas but would also prevent indirect impacts including accidental contamination.

No Action Alternative

Under the No Action Alternative, the lease sale would not occur and there would be no concerns or issues with solid or hazardous wastes. Activities on currently leased parcels adjacent to the proposed parcels would remain on-going as permitted on surrounding federal, state, and private lands.

3.2.8. Water Resources: Surface and Ground

Affected Environment

The lease area is part of the Basin and Range Physiographic Province, a semiarid and arid desert environment with precipitation originating as cooler season snow, warmer season rainfall, and occasional late summer monsoonal events. Daily weather station data collected at the Geyser Ranch (NWS Co-op 263101) climate station indicates the average annual precipitation is 8.95 inches, and snowfall generally occurs from October through April. The highest temperatures (average 88.9°F) are reached in July and the lowest temperatures (average 9.9°F) are reached in January for the period of record 1904 – 2003 (WRCC, 2024). The Geyser Ranch climate station is the nearest climate station to the lease parcel and is located approximately 13 miles NNW of the lease parcel area. Evapotranspiration occurs at a rate of approximately 4.5 acre-feet per year (afy) in the vicinity of the proposed lease parcel (NDWR, 2024a).

Regulatory Background

The Nevada Division of Environmental Protection (NDEP) monitors water quality in Nevada. NDEP has established water monitoring points within the hydrographic regions of Nevada. At these monitoring points, NDEP specifies the Nevada Water Quality Standards and makes them available for review in Nevada Administrative Code NAC 445A.1242. These standards apply to all surface water in the watershed upstream from the monitoring point. NDEP also oversees groundwater quality by laying out the standards required for remediation of groundwater contamination.

The Ely District RMP requires that authorized activities on public lands do not degrade water quality. This includes compliance with the federal Clean Water Act and the Nevada Water Pollution Control Regulations laid out in Nevada Revised Statute NRS 445A. RMP water resource management action WR-2 also requires the integration of land health standards, BMPs, and appropriate mitigation measures into authorized activities to ensure water quality meets Nevada requirements and meets the BLM water quality management objectives described in BLM Water Quality Manual 7240 and its 7240 Supplement. Additionally, any water used for exploration or production of oil and gas resources would need to comply with the water laws of Nevada and with the water rights guidelines laid out in BLM Water Rights Manual 7250. The State of Nevada is the ultimate authority over Nevada water laws which are administered through the Nevada Division of Water Resources (NDWR) and whose compliance therewith is mandatory to ensure that water extracted for exploration and development purposes does not impact the rights of senior water right holders.

Groundwater Resources

Groundwater in Nevada comes from water stored in aquifers, which are geologic units capable of transmitting water at rates that are economically feasible. In eastern Nevada, groundwater sources originate in aquifers contained in widespread geologic units composed of alluvium, carbonate, and

volcanic rocks (Welch et al., 2007). These units store water that has infiltrated from precipitation falling on hydrographic basins, which are the water resource management units used by NDWR. The parcel being analyzed for lease under this EA is located on a low-lying area of Lake Valley (Hydrographic Basin 183) in Lincoln County. Regional groundwater moves through Lake Valley in a southerly direction and becomes part of an interbasin groundwater system as a portion of this flow moves into the Spring Valley subsurface, the adjacent hydrographic basin to the east (Welch et al., 2007). Each basin in Nevada has a perennial yield, which is the volume of groundwater that can be withdrawn from a basin without exceeding the long-term annual natural recharge. The perennial yield volumes for Nevada's hydrographic basins were calculated between 1963 and 1975 during a cooperative reconnaissance study between NDWR and the U.S. Geological Survey. Lake Valley has a perennial yield of 12,000 afy (NDWR, 2024a).

NDWR issues water rights to applicants seeking to use water in Nevada that when combined for all water rights holders and applicants yields a total appropriation volume for the basin. Lake Valley has an appropriation volume of approximately 17,000 afy, which is greater than the perennial yield for the basin. When the appropriation volume exceeds that of the perennial yield, the basin is said to be over-appropriated. The Nevada State Engineer (NSE) at NDWR has issued orders in some over-appropriated basins to designate the basin if conditions are such that groundwater resources are being depleted at rates that outpace annual recharge. Following a basin designation, the NSE has the additional authority to issue appropriations only for preferred uses. Examples of preferred uses include water for municipal, domestic, industrial, and agricultural applications. Lake Valley has been designated under NSE Order O-726, however the Order does not name any preferred uses (NDWR, 2024b).

Several wells exist within a five-mile radius of the lease parcel that are being used for stockwater based on the listed water rights (NDWR, 2024c). The wells are commonly drilled to depths of around 200 to 400 feet with depths to static groundwater levels ranging from 30 feet to 200 feet below ground surface (NDWR, 2024d).

Surface Water Resources

There are no perennial streams in the lease parcel area. A vested water right is described for Gold Spring approximately two miles east of the lease parcel boundary (NDWR, 2024c). Several springs reside in the higher elevations several miles to the east and west of the lease parcel location. Many ephemeral channels originate on the slopes of the Fortification range to the east and Dutch John Mountain and the Schell Creek range to the west that drain toward the valley floor.

Environmental Effects

Proposed Action

Groundwater Resources

Impacts to groundwater resources that could occur following an APD approval include introduction of drilling fluids into groundwater, contamination of groundwater from petroleum and other chemicals through spills, well casing leaks, pipeline leaks, and loss of hydraulic fracturing (HF) fluids into groundwater during HF operations. Similarly, improper construction and management of evaporation pits can impact ground water quality through leakage and leaching. Lowering of the groundwater table from groundwater pumping for exploration and production can impact local groundwater wells and associated water rights and can impact groundwater-dependent ecosystems that support a wide range of wildlife and aquatic species.

Authorization of the proposed projects would require compliance with local, state, and federal directives, regulations, permitting, and stipulations that relate to groundwater protection, as well as federal and State

of Nevada guidelines for hydraulic fracturing. These include strict drill casing cementation and sealing requirements to prevent leakage into groundwater and communication along the drill bore between water-bearing geologic units. To guard against impacts to groundwater resources, the BLM would work with the permittee to develop site-specific conditions of approval and design features at the APD stage.

Surface Water Resources

Impacts to surface water resources that could occur following an APD approval include alterations to the hydrologic regime such as increased sediment loads during runoff events, increased erosion during construction phases, and alteration of overland flow patterns from clearing, grading, and soil stockpiling activities. Hydrocarbons and mobile chemicals on the surface associated with development projects could be delivered along with sediments into natural drainage channels and delivered downstream.

Implementation of BMPs along with compliance with state and federally imposed sedimentation and runoff control measures would be required to effectively prevent project-related transport and delivery of sediments or fluids that may impair surface water resources. To guard against these impacts, the BLM would work with the permittee to develop site-specific conditions of approval and design features at the APD stage.

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 parcels would remain on-going as permitted on surrounding federal, state, and private lands.

3.2.9. Vegetation Resources

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 type and precipitation regime. The Natural Resource Conservation Service completed soil surveys which contain ecological site descriptions. 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 primarily include Big Sagebrush, and Black Greasewood.

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 wind and water soil erosion, soil compaction, and increases disturbance to microbiotic crusts and topsoil. Condition of microbiotic crusts and topsoil directly affect plant establishment and growth. Disturbance and removal of vegetation may cause invasion of nonnative species or shifts in species composition.

Environmental Effects

Proposed Action

There would be no direct effects from issuing new oil and gas leases as leasing does not authorize oil and gas exploration and development activities. Direct impacts would be considered under additional site-specific NEPA analysis when an action is proposed and specifics are known, like location, well depth,

water consumption needs, and area of disturbance. Through this process, site-specific preventative measures, such as weed prevention, and Best Management Practices (BMPs), such as cleaning vehicles before and after entering the work area, would be attached as Conditions of Approval (COA) for each proposed activity. The Reasonably Foreseeable Future Development (RFFD) is the basis for assessment of potential impacts that could occur after the parcels are leased.

Removal and crushing of vegetation under the RFFD would increase the amount of bare ground, thus increasing wind and water erosion, and increasing potential for invasion by nonnative and noxious species. This would likely result in a shift in vegetation community composition. Considering the total potential extent of long-term disturbances anticipated in the RFFD scenario, the effect on vegetation is expected to be comparatively less than the areas offered for lease in the Proposed Action. Short term disturbances would be rehabilitated with consideration for ecological site potential and existing vegetation in the area. Impacts to most vegetation communities are expected to be relatively minor, short term, and localized.

Under the RFFD, impacts to vegetation may be exacerbated by effects to the quality and quantity of water and lowering of the groundwater table. If water resources were affected in these parcels, despite mitigation measures and BMPs, it could create changes in vegetation composition, abundance, and cover.

No Action Alternative

The No Action Alternative would create no additional impacts to vegetation 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.

3.2.10. Fish and Wildlife

Affected Environment

The oil and gas parcel provide habitat for numerous wildlife species. Common big game species that inhabit parcel NV-2024-06-2007 include year-round habitat for pronghorn antelope, Rocky Mountain elk and mule deer. There is no crucial summer or winter habitat and therefore no big game seasonal stipulations would be applied to the parcel. Other wildlife species that inhabit this parcel include coyotes, jackrabbits, badgers, and numerous bird, reptile, and small mammal species.

Environmental Effects

Proposed Action

There would be no direct effects from issuing a new oil and gas lease because leasing does not directly authorize oil and gas exploration and development activities. Direct impacts from these activities would be analyzed under a separate, site-specific NEPA analysis. The RFFD is the basis for indirect future or potential impacts that could occur once the parcel is leased. General short-term and long-term impacts of oil and gas to general wildlife species are discussed in the Ely District PRMP/FEIS (2007) in Section 4.6 Fish and Wildlife on pages 4.6-14 – 4.6-15. Short-term impacts analyzed in the Ely District FEIS include vegetation loss, habitat fragmentation, wildlife displacement, and increased noise and human presence. Long-term impacts analyzed in the Ely District FEIS include irretrievable loss of habitat, change in vegetation composition, and habitat fragmentation and wildlife displacement. There would be no big game seasonal restrictions applied to this parcel because there is no crucial winter or summer habitats.

No Action Alternative

Under the No Action Alternative, the lease sale would not occur, and impacts to fish and wildlife would remain the same. Activities on currently leased parcels adjacent to the proposed parcel would remain ongoing as permitted on surrounding federal, state, and private lands.

Special Status Species

Affected Environment

BLM Manual 6840 entitled *Special Status Species Management* states BLM special status species are those that 1) are listed or proposed for listing as endangered or threatened under the Endangered Species Act (ESA), and 2) species requiring special management consideration to promote their conservation and reduce the likelihood and need for future listing under the ESA, which are designated as Bureau Sensitive by the State Director(s). Additionally, all federal candidate species, proposed species and delisted species in the five years following delisting would be conserved as Bureau sensitive species.

A GIS analysis was conducted using data from BLM, Nevada Department of Wildlife, US Fish and Wildlife Service, and the Nevada Division of Natural Heritage to determine locations of sensitive species in relation to the leased parcel. The table below identifies special status species that may occur within or adjacent to the parcel. It also includes aquatic species within the hydrobasin that could be affected by groundwater changes. An additional review of special status species would occur when an APD is submitted and may result in subsequent surveys of sensitive species. A list of BLM Special Status Species (BLM 2023) can be found in Appendix B

Federally Threatened and Endangered Species

There are no federally threatened or endangered species within the proposed parcel, however the monarch butterfly was petitioned for listing under the Endangered Species Act but was determined listing was warranted but precluded by higher priority species and the monarch is now considered a candidate species. Monarch butterflies can be found throughout Nevada and rely heavily on milkweed for their food source.

Greater sage-grouse

According to the 2015 ARMPA, and the updated Greater Sage-Grouse Habitat Management Area (HMA) Maps from the 2022 Plan Maintenance Action, the parcel is not in greater sage-grouse habitat and there are no active and pending leks within four miles of the parcel. No seasonal stipulations apply because the parcel is not in a designated HMA. However, due to the proximity of greater sage-grouse habitat the parcel would require coordination with the Sagebrush Ecosystem Technical Team to determine if participation in the Nevada Conservation Credit System (CCS) is required.

Aquatic

The Lake Valley pyrg is known to occur within the Lake Valley hydrobasin.

Birds and Raptors

Analyzed in Migratory Bird Section below.

Plants

Parish phacelia is known to occur in Lake Valley north of the parcel.

Environmental Effects

Proposed Action

There would be no direct effects from issuing new oil and gas lease because leasing does not directly authorize oil and gas exploration and development opportunities. Direct impacts from these activities would be analyzed under additional, site-specific NEPA analysis in responds to APDs. The RFFD analysis is the basis for indirect future or potential impacts that could occur once the parcel is leased. Impacts would be similar to those described under Fish and Wildlife Section of this document such as habitat loss and/or degradation or displacement from noise and human presence. General short-term and long-term impacts of oil and gas to special status species are discussed in the 2007 Ely District PRMP/FEIS in Section 4.7 Special Status Species on pages 4.7-33 – 4.7-39. Because of the highly specialized and endemic nature of some special status species, additional surveys and/or mitigation may be needed at the exploration and development stages.

Notices and timing stipulations would minimize some effects to special status species. For example, the raptor nest timing stipulations would minimize effects to ferruginous hawks and western burrowing owls during the breeding season.

Threated and Endangered

Impacts to the monarch butterfly during oil and gas development are anticipated to be minimal. Short term and long-term impacts would be similar to as described above for special status species in the Ely District PRMP/FEIS.

Greater sage-grouse

Oil and gas development to greater sage-grouse would have similar affects as described above for special status species in the Ely District PRMP/FEIS. There would be no impacts to leks from oil and gas development at these parcels, and no loss or disturbance to habitat. Due to the parcels being in non-habitat, there are no seasonal timing restrictions applied. Coordination would need to occur with the SETT due to proximity of greater sage-grouse habitat to the parcel.

Aquatic

The impacts to groundwater resources (Section 3.2.8) is discussed above. Additionally, the effects of oil and gas leasing and development to aquatic species are discussed in the 2007 Ely District PRMP/FEIS in Section 4.7 Special Status Species on pages 4.7-34 – 4.7-38. Oil and gas development could affect aquatic habitat by altering riparian vegetation, reducing water levels or flow by water consumption or disruption of the groundwater supply, and degrading the water quality from surface disturbance, runoff, and contaminant leaks or spills, depending on proximity of development to habitat. Oil and gas projects would require compliance with local, state, and federal directives, regulations, permitting, and stipulations that are related to groundwater protection as well as federal and State of Nevada guidelines for hydraulic fracturing. Additional site-specific NEPA analysis of the potential for groundwater impact would be conducted prior to any approval of an APD.

Birds and Raptors

Analyzed in the migratory bird section below.

Plants

Oil and gas exploration and production activities, as outlined in the RFFD, have the potential to effect sensitive vegetation by reduction or loss in production, distribution, and vigor of sensitive plant species or communities. Additionally, ground disturbance and activities associated with oil and gas have the potential to introduce invasive plant species to communities that currently lack invasive plants.

No Action Alternative

Under the No Action Alternative, the lease sale would not occur, and no impacts to special status plant or animal species would occur. Activities on currently leased parcels adjacent to the proposed parcels would remain on-going as permitted on surrounding federal, state, and private lands.

Migratory Birds

Affected Environment

Bird species protected by the Migratory Bird Treaty Act (MBTA) are found throughout the analysis area. Riparian vegetation associated with perennial streams, seeps, and springs is particularly important for a diverse migratory bird community. The parcel includes habitat for migratory bird species on a seasonal or yearlong basis. Special status bird species are also covered by the MBTA.

Environmental Effects

Proposed Action

There would be no direct effects from issuing oil and gas leases because leasing does not directly authorize exploration or development, or any other ground disturbing activities. Direct impacts from these activities would be analyzed under additional, site-specific NEPA analysis once an APD is submitted. The RFFD analysis is the basis for indirect future or potential impacts that could occur once the parcels are leased. Indirect effects may occur during the exploration and development phase. These effects would be analyzed at the time these activities are proposed. In addition to the generalized potential effects to fish and wildlife, effects to migratory birds may include temporary, individual or population displacement from preferred habitat, decreased clutch survival, increased potential for animal mortality or behavior changes, and physiological stress that negatively affects fitness. A stipulation would be applied during the migratory bird nesting season to minimize the effects discussed above.

No Action Alternative

Under the No Action Alternative, the lease sale would not occur, and no impacts to migratory birds would occur. Activities on adjacent lands would remain on-going as permitted on surrounding federal state, and private lands.

3.2.11. Visual Resource Management

Affected Environment

The proposed parcels nominated for lease fall within Visual Resource Management (VRM) Classes designated in the Ely RMP (BLM 2008). BLM administered lands are placed into four visual resource inventory classes: VRM Classes I, II, III, and IV. Class I and II are the most sensitive, Class III represents a moderate sensitivity and Class IV is of the least sensitivity (Table 3.12). VRM classes serve as a management tool that provides an objective for managing visual resources.

Table 3.12 VRM Classification Objectives

VRM Classes	Visual Resource Objective	Change Allowed (Relative Level)	Relationship to the Casual Observer
Class I	Preserve the existing character of the landscape. Provide for natural ecological changes; however, it does not preclude very limited management activity.	Very low	Activities must not attract attention.
Class II	Retain the existing character of the landscape. The level of change to the characteristic landscape should be low.	Low	Activities may be seen, but should not attract attention.
Class III	Partially retain the existing character of landscape. The level of change to the characteristic landscape should be moderate.	Moderate	Activities may attract attention but should not dominate the view.
Class IV	Provide for management activities, which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high.	High	Activities may attract attention, may dominate the view.

The Ely District is typical Basin and Range topography with north to south trending mountain ranges with valleys in between. Vegetation is predominantly grasses and shrubs in the valleys leading to pinion and juniper woodlands on the ranges. Vegetation colors are predominantly tan, light sage green to darker greens. Exposed rock is limestone, quartzite, and some volcanic with colors of grey, tan, brown. Soils have similar lighter colors of grey, tan and brown. Typical visible man-made features in the areas could include, roads, vegetation treatments, mining activity, fences, power lines, and range improvements.

Parcel ID NV-2026-06-2007 is situated within Lake Valley and situated within VRM Class III (Map 3). The parcel will mostly be viewed by those traveling Highway 93. The casual observers will have a complete view of the project area as it is situated downhill in the lowest point of the wide-open valley in the middle of a remnant Pleistocene era lakebed. Vegetation is somewhat denuded and sparse consisting of thinly dispersed and scattered grasses and shrubs with colors of tan, grey, and sage green. Calcareous soils are the predominant characteristic landscape feature and are that of a remnant lakebed and are white, grey, and tan when dry and darker when wet or covered by standing water. There are very few structures present except for a few two track roads and fence lines.

Environmental Effects

Proposed Action

The actual sale of the lease parcel would not impact visual resources. However, if resources are discovered and there is development and construction of production facilities there could be negative impacts to visual resources. The lease parcel is located in a wide-open valley where there are not currently

any oil and gas production facilities and almost no structures. To have any production facilities appear within this area could generate a contrast that is moderate to high. There would be design features required for production facilities that will help keep the contrast moderate to low and aid in not attracting attention. Design features would include low profile facilities and painting of facilities with the appropriate Standard Environmental Color. In addition, the locations topography or addition of topographic screening may aid in hiding or obscuring development or production facilities. Application of these design features for the parcel and whether it will meet the VRM Class III objective is listed below.

Parcel ID NV-202-06-2007, as previously mentioned, would mostly be viewed by those traveling Highway 93. The casual observers will have a complete view of the parcel as it is situated downhill in the lowest point of the wide-open valley in the middle of a remnant Pleistocene era lakebed. Low profile facilities and topographic screening will not aid in hiding or obscuring development or production facilities. Painting facilities an appropriate Standard Environmental Color would be the only real option in lessening the contrast and aid in obscuring visibility of facilities. Without an understanding of how many production facilities could be present it is difficult to ascertain whether production facilities on this parcel would or would not meet the VRM Class III objective. If there were only a few access roads and well pads for 5 pump jacks and 1 storage tank which were painted the appropriate Standard Environmental Color, although it would be seen, it would not dominate the viewshed which would meet the VRM Class III objective. However, if there were numerous access roads and well pads for 50 pump jacks and there were 10 storage tanks, even when painted the appropriate Standard Environmental Color, the production facilities may possibly become a dominating feature of the landscape which would not meet the VRM Class III objective.

No Action Alternative

Under No Action Alternative the lease sale would not occur, therefore no additional impacts to visual resources would occur.

3.2.12. Livestock Grazing

Affected Environment

The proposed parcel nominated for lease falls within the boundary of the Geyser Ranch (#NV01101) Grazing Allotment, administered by the Caliente Field Office. The potential area of impacts to livestock grazing and forage resources include portions of Geyser Ranch grazing allotment in Lake Valley. The affected allotment and associated use area/ pasture names and acreages are listed alongside the proposed oil and gas lease parcels and the percentage of the area that would be affected in Appendix B, Table B2. The Ely District Approved Resource Management Plan (2008) authorizes livestock grazing on the affected allotment and authorized grazing on Geyser Ranch Allotment includes yearlong cattle active use.

Term permits authorize grazing use based on perennial vegetation. Authorized grazing use is in accordance with established use periods or seasons of use for the allotment. Grazing systems may include rest-rotation, deferred rotation, and deferred rest rotation. Allotments that are grazed yearlong include herding of cattle between public land allotments, base property, other leased or private pasture and U.S. Forest Service-administered lands. Livestock are either mixed in the same use area or graze in separate use areas of the allotment.

Environmental Effects

Proposed Action

There would be no direct effects to livestock grazing from issuing new oil and gas leases because leasing does not directly authorize oil and gas exploration and development activities. Should exploration or

development be proposed within leased parcels, additional, site specific NEPA analysis would be completed to assess potential impacts to livestock grazing within the project area when an APD is submitted. The Reasonably Foreseeable Future Development (RFFD) scenario is the basis for indirect potential impacts that could occur after the parcels are leased.

Under the Proposed Action for the lease sale, livestock grazing would continue. However, should oil and gas development occur on the lease, loss of forage and possible reductions of permitted Animal Unit Months (AUMs) could occur in the affected allotment due to soil and vegetation disturbances from development activity. Livestock movement patterns could be altered and access to range improvements could be hindered by new roads, oil well pads, and human presence and activity. Increased traffic may lead to an increase in vehicle-livestock collisions, and increased livestock mortality. Potential impacts specific to the allotment, pastures, and range improvements would be analyzed with additional site-specific NEPA review at the APD stage. Any mitigation measures and design features protecting range improvements would be identified at the development stage.

No Action Alternative

Under the No Action Alternative, the lease sale would not occur and no impacts to livestock grazing resources would occur. Activities on currently authorized leased parcels would remain on-going as permitted on surrounding federal, state, and private lands.

3.2.13. Geology and Mineral Extraction

Affected Environment

Geology

The Ely District falls within the Basin and Range province and 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 geothermal and hydrocarbon resources.

During the Paleozoic, sediments were deposited in a shallow marine environment in the analysis area. Thick sequences of marine sediments were deposited, including the Devonian carbonaceous Pilot Shale and the Mississippian Chainman Shale, a black shale with high organic content and a potential source rock for hydrocarbons. Thickness of the sediments decreases to the southeast.

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

Locatable Minerals historically or currently mined 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 Materials 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.

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; 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 May 12, 2023, there were 321 authorized oil and gas leases in the state of Nevada, 84 of which are in the Ely District primarily within the Bristlecone Field Office. Nevada has produced more than 50 million barrels of oil since 1955 and is suspected to have significant oil resources still yet to be produced (NDOM). East-central Nevada has a history of oil production, a significant portion of which occurred in the Bristlecone Field Office. 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 within the Analysis Area (Anna et al. 2007). The Chainman and Sheep Pass Formations notably host hydrocarbons in the Railroad Valley area as source rock.

Geothermal resources in the Ely District have been thought to have low to moderate temperatures for potential production of geothermal energy (BLM, 2007). There are currently no active geothermal production areas within the Ely District planning area (Muntean J.L. & Davis D.A., 2021).

Environmental Effects

This section discusses the potential impacts from leasing nominated parcels according to the two alternatives. Information on mineral claims, leases, exploration, and development was obtained using reports pulled from BLM's Oracle Legacy Rehost software on December 20, 2023.

Proposed Action

Locatable Minerals

No mining claims occur in the nominated parcels. Additional research involving the NVSO and county courthouses to determine if any claims overlap the parcels is not necessary for this level of analysis.

Further research would be conducted during additional site-specific NEPA analysis when an APD is submitted, given the parcels would be leased.

Oil and Gas leasing, exploration, and development could interfere with the exploration and extraction of locatable minerals on a parcel. Potential interference may be mitigated at the time of development by coordination and agreement between the operators. Additionally, oil and gas exploration and development in Nevada typically involves reclamation within ten years; therefore, it may only temporarily affect locatable mineral operations, if simultaneously authorized.

Mineral Materials

None of the nominated parcels contain active mineral material sites. Issuing oil and gas leases on these lands would allow for development of potential oil, oil shale, and gas deposits, and should have minimal to no effect on potential future development of other mineral materials (e.g. sand, gravel, dimension stone, etc.).

Leasable Minerals

No nominated lands contain existing leases. Issuing oil and gas leases on these lands would allow for development of potential oil, oil shale, and gas deposits, and should have minimal to no effect on potential future development of other leasable minerals (e.g. geothermal, phosphate, sodium, etc.).

No Action Alternative

The No Action Alternative would not have an effect on locatable minerals, mineral materials, or leasable minerals except that it would reduce the opportunity for exploration and discovery of potential oil and gas deposits that are needed to supply local, regional, and national needs.

Chapter 4. Cumulative Impacts

4.1. Resources

As required under the NEPA and the regulations implementing the NEPA, this section analyzes potential cumulative impacts from past, present, and reasonably foreseeable future actions (RFFAs) combined with the Proposed Action within the area analyzed for impacts in Chapter 3 specific to the resources for which cumulative impacts may be anticipated.

A cumulative impact is defined as “the impact which results from the incremental impact of the action, decision, or project when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time” (40 Code of Federal Regulations (CFR) 1508.7).

The geographic scope of a cumulative effect is defined in this EA with the Cumulative Effects Study Area (CESA). Unless otherwise stated, the CESA for a resource is Lake Valley, NV. Two or more resources may have the same CESA.

For the purpose of this EA, only indirect impacts are discussed in this section. Direct incremental cumulative impacts from a potentially proposed oil well would be analyzed during the APD review process. There are no cumulative impacts from leasing. The following is a discussion of cumulative impacts resulting from potential future development under the RFFD described in Section 2.4 of this EA.

4.2. Past, Present, and Reasonably Foreseeable Future Actions

Past Actions

The Ely District is rich in natural resources and the cumulative effects study area has been used for a wide array of activities over the years. Mining, grazing, recreation, realty actions, and oil exploration have been conducted throughout the Ely District and more than likely, would continue for many more years. While more than 200 wells have been drilled in the Ely District, only two are in production.

Present Actions

Refer to the affected environment discussions in Chapter 3 for presently authorized activities affecting the nominated parcels.

Reasonably Foreseeable Future Actions

Table 4.1 shows a list of Reasonably Foreseeable Future Actions (RFFA) that have been analyzed for environmental impacts within the project area. Mining, grazing, recreation, realty actions, fuels treatments and oil exploration are being conducted throughout the Ely District. For purposes of this cumulative impacts analysis the project area includes Nye, White Pine, and Lincoln Counties. The approximate total ground disturbance of RFFAs is 302 acres.

Table 4.1 Reasonably Foreseeable Future Actions

Project Name	Location (County)	Type of Action	Acres of Disturbance
Mackie Tenacity Mines	Lincoln County	Minerals	40
Panaca Pozzolan	Lincoln County	Minerals	5
C-Cath Gorge	Lincoln County	Minerals	5
Atlanta Mine Exploratory Drilling	Lincoln County	Minerals	22
Gold Springs Exploration	Lincoln County	Minerals	100
Window Peak	Lincoln County	Minerals	20
Notices of Intent	Lincoln County	Minerals	5*
Notices of Intent	White Pine County	Minerals	5*
Outcome Based Grazing Range Improvements	Lincoln/Nye/White Pine	Grazing	100*
Total 302			

*Approximate

4.3. Cumulative Impacts**4.3.1. Air Quality, Greenhouse Gas (GHG) and Climate Change****Proposed Action****Criteria Pollutants and HAPs**

The air quality CESA for the proposed action is the BLM Ely District represented by air emissions for White Pine and Lincoln counties. Table 4.2 presents maximum annual total criteria pollutant and HAP emissions from EPA source categories in the CESA in 2020 compared with maximum potential emissions related to the proposed lease sale. The 2020 NEI includes emissions from Bald Mountain Mine and Robinson Mine, the two largest sources listed in Table 4.1 above. Table 4.2 shows that the lease sale would have lower emissions than residential fuel use and would cause only a very small increase, 0.22% or less, in cumulative emissions. The proposed lease sale would not be likely to change air quality impacts in the Ely District a discernable way.

Table 4.2 Proposed Lease Sale Emissions in Context with Sources of Air Pollution in Ely District, 2020

Source	Criteria tons per year	%	HAPs tons per year	%
Wildfire	45,385	39.53%	1,475	14.28%
Biogenics	56,065	48.83%	8,736	84.56%
Industrial Processes other than Petroleum and Natural Gas	4,380	3.81%	0	0.00%
Mobile Sources	4,098	3.57%	65	0.63%
Fugitive Dust	2,684	2.34%	0	0.00%
Agriculture	1,402	1.22%	5	0.05%
Residential Fuel Combustion	383	0.33%	17	0.16%
Proposed Action - Maximum Year	251	0.22%	8.5	0.08%

Waste Disposal	142	0.12%	4	0.04%
Solvent Use	162	0.14%	21	0.20%
Oil & Gas Midstream	96	0.08%	8	0.08%
Commercial Cooking	19	0.02%	0	0.00%
Commercial and Industrial Fuel Use	0	0.00%	0	0.00%
Oil & Gas Production	0	0.00%	0	0.00%
Total	115,068	100%	10,340	100%

Ely District includes NEI emissions from White Pine and Lincoln 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>

GHG and Climate Change

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.

The Annual GHG Report provides an estimate of short-term and long-term GHG emissions from activities across the BLM's oil and gas program. The short-term methodology presented in the Annual GHG Report includes a trends analysis of (1) leased federal lands that are held-by-production⁴ (2) approved applications for permit to drill (APDs), and (3) leased lands from competitive lease sales occurring over the next annual reporting cycle (12 months), to provide a 30-year life of lease projection of potential emissions from all Federal oil and gas lease actions over the next 12 months. The 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.

Table 4.2 shows the aggregate GHG emissions estimate that would occur from Federal leases, existing and foreseeable, between the years 2022 and 2050, using the methodology described

⁴ [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.

above. 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 4.2 GHG Emissions from Past, Present, and Reasonably Foreseeable Federal Onshore Lease Development (Mt CO₂e)

State	Existing Wells (Report Year)	Existing Wells (Projected)	Approved APDs	New Leasing	Short-Term Totals	Long-Term 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
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
<i>Total Onshore Federal</i>	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.

As this is an assessment of what BLM has projected could come from the entire Federal fossil fuel program, including the projected emissions from the proposed action, over the next 30 years, the reasonably foreseeable lease sale emissions contemplated in this EA are not expected to substantially affect the rate of change in climate effects, bring forth impacts that are not already identified in existing literature, or cause a change in the magnitude of impacts from climate change at the state, national, or global scales.

The most recent short-term energy outlook (STEO) published by the EIA (<https://www.eia.gov/outlooks/steo/>) (EIA, 2023) predicts that the world's oil and gas supply and consumption will increase over the next 18-24 months. The latest 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. The most recent STEO includes the following projections for the next two years:

- U.S. liquid fuels consumption is projected to increase to 20.35 million barrels per day (b/d) in 2024 up from 20.15 million b/d in 2023.
- U.S. crude oil production is expected to average 12.9 million b/d in 2023 and rise to 13.5 million b/d in 2024.
- U.S. natural gas consumption is expected to average 89.42 Bcf/d in 2023, decreasing slightly to 89.0 Bcf/d in 2024.
- U.S. LNG exports are expected to increase from 11.8 billion cubic feet/day (Bcf/d) in 2023 to 12.29 Bcf/d in 2024.
- U.S. Coal production is expected to total 585 million short tons (MMst) in 2023 and 480 MMst in 2024 and decrease to 15% of total U.S. electricity generation in 2024 compared to 16% 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 22% 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, economy wide, 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.

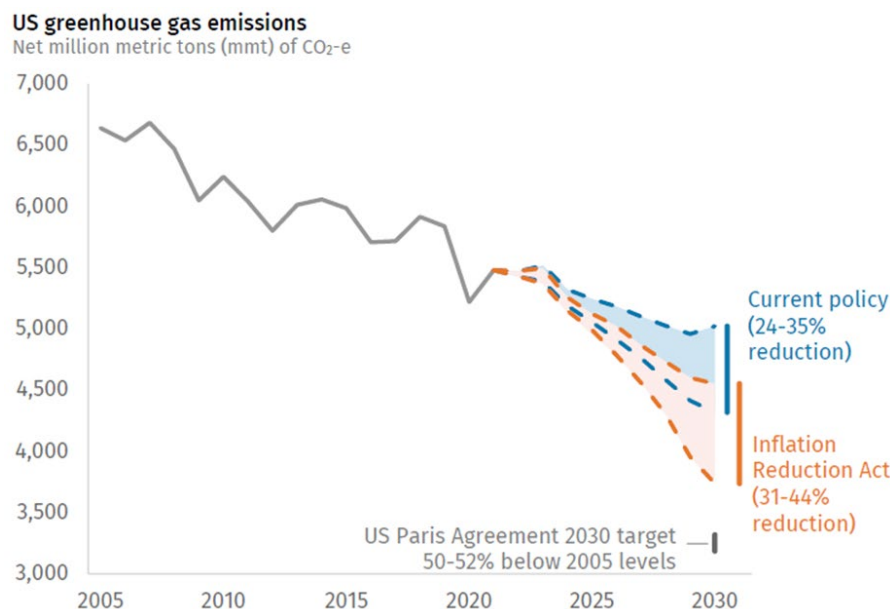
Carbon budgets are an estimate of the amount of additional GHGs that could be emitted into the atmosphere over time to reach carbon neutrality while still limiting global temperatures to no more than 1.5°C or 2°C above preindustrial levels (see section 9.1 of the Annual GHG Report (BLM, 2023)). The IPCC 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 lease sale 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.

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



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.

Emission Control Measures Considered in the Analysis

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 (49 CFR 60, subpart OOOOa) which imposes emission limits, equipment design standards, and monitoring requirements on oil and gas facilities. 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. 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.

No Action

The No Action Alternative would add no incremental impacts air resources beyond those occurring under current management. Activities within the CESA would remain on going as permitted on surrounding federal, state, and private lands.

4.3.2. Cultural Resources

Proposed Action

The Proposed Action would have indirect and cumulative impacts to cultural resources in the event that an APD is approved and development proceeds. Any development on leased parcels would be subject to Section 106 of the National Historic Preservation Act (NHPA) and additional NEPA analysis. Since no cultural inventory has occurred on the Lake Valley parcel, a BLM Class III cultural resource inventory will be required before lease development ground disturbing activity proceeds. This inventory may result in the identification of currently undocumented NRHP-eligible cultural resources. The lease parcel may contain additional NRHP-eligible sites, historic properties, Traditional Cultural Properties (TCPs), and/or sacred sites currently unknown to the BLM that were not identified during the initial lease parcel review process. When NRHP-eligible cultural resources are present, consultation and mitigation is required before the undertaking may proceed. Consultation takes place between the BLM, State Historic Preservation Office (SHPO), concerned Native Tribes, and interested public. Avoidance is the preferred method of mitigation to preserve and protect NRHP-eligible cultural resources. Through consultation, other mitigation measures may be considered on a case-by-case basis. Any party proposing oil and gas exploration or development on leased parcels shall be responsible for all costs related to conducting Section 106 of the NHPA. The successful lease of a parcel does not guarantee the feasibility of future oil and gas exploration or development.

No Action Alternative

The No Action Alternative would have no cumulative impacts to cultural resources. Current activities on surrounding federal, state, and private lands would remain on-going as permitted.

4.3.3. Environmental Justice and Socioeconomics

Proposed Action

Adverse impacts to environmental justice communities could occur as a result of development and projects outside the lease areas, such as continued oil and gas developments, an increase of traffic to the area, additional recreational development, and continued issuance of ROWs. Although these projects vary in scope and degree of disturbance, developments and their associated impacts may persist for the next 20 years. As mentioned in the proposed alternative analysis, more temporary impacts to air quality from dust and long-term impacts to land characteristics could increase as a result of developments and would have to be mitigated through site-specific NEPA analysis at the APD stage. Combined impacts from oil and gas development and an overall increase in population and human activity could contribute to disproportionate effects on the surrounding environmental justice and socioeconomic communities in Lincoln and White Pine counties, NV.

Rapid population growth can strain community resources, such as educational infrastructure, roads and utilities, and emergency services. Rapid population growth can also reduce community cohesion. To the extent EJ and socioeconomic communities are more dependent upon public service provision and/or community cohesion and development causes a decrease in community service availability and community cohesion, EJ communities may be adversely and disproportionately affected by rapid population changes.

The level of inconvenience felt by local communities would depend on the magnitude and proximity of the developments, a change in traffic patterns, noise levels, and the length of time and season in which these activities occurred. Creation of new access roads could allow increased public access and exposure of private property to vandalism. EJ communities often do not have the resources to combat these impacts. For leases in which the surface is privately owned and the mineral estate is federally owned,

surface owner agreements, standard lease stipulations, and BMPs could address many of the concerns of private surface owners. The BLM would be responsible for identifying cumulative impacts in future NEPA analysis to mitigate potential inconveniences and disproportionate effects on EJ communities.

No Action

The No Action Alternative would have no cumulative impacts to environmental justice populations or socioeconomic communities. Current activities on surrounding federal, state, and private lands would remain on-going as permitted.

4.3.4. Soils

Proposed Action

The CESA for soils would be the 2080-acre area covered under the lease parcel boundary, as this would represent the area where the greatest soil impacts would occur following an APD approval. Impacts to soils from land use activities that have occurred in the past as well as in the present in areas all over the District would likely have been and would be occurring within the soils CESA. These past and present actions would include activities such as grazing, road construction and maintenance, OHV use and recreation, mining and processing activities, aggregate operations, public land management activities, wild horse activity, power lines and other rights of ways, and wildland fire. In addition to the RFFAs listed in Table 4.1, these activities would be expected to continue within the CESA and impacts from these RFFAs to soils would be like those described for past and present actions. Reclamation of areas disturbed from past and present actions and natural revegetation have helped lessen these impacts.

The cumulative impact to soils from the incremental impact from parcel development following an APD approval, when added to the past actions, present actions, and RFFAs may add effects like those described in section 3.2.5 above for soils. However, lease stipulations and conditions of approval, coupled with compliance with state and federally imposed regulations, would help to minimize the level of these incremental impacts.

No Action Alternative

The No Action Alternative would add no incremental impacts to soils in the analysis area beyond those occurring under current management. Activities within the CESA would remain on going as permitted on surrounding federal, state, and private lands.

4.3.5. Human Health and Safety

Proposed Action

Oil and gas developments, in addition to other extractive activities like gold and copper mining, have been occurring in Nevada for many decades. Continued expansion of the oil and gas industry may be perceived as having a negative effect on quality-of-life considerations for people who value undeveloped landscapes, opportunities for isolation, and activities such as wildlife viewing, other forms of recreation, or rangeland management. The total landscape-level surface disturbance associated with reasonably foreseeable environmental trends and planned actions would include activities that generate increased human activity, traffic, noise, dust, odor, light pollution, and visual effects. These activities have the potential to affect quality of life of any existing nearby residences or facilities, depending on the intensity of development activities and proximity of structures to a given parcel. While the majority of these impacts to any significantly proximal residences or facilities would be short term and cease during operations (e.g., increased human activity, traffic, noise, dust, and odor during drilling and completion phases), residences may continue to experience long-term visual or other impacts that have potential to

affect quality of life if they are located in areas in which oil and gas development is not currently nearby or visible.

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 2021h). 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 air quality 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).

No Action Alternative

The No Action Alternative would have no cumulative impacts to Human Health and Safety. Activities on currently leased parcels adjacent to the proposed parcels would remain on-going as permitted on surrounding federal, state, and private lands.

4.3.6. Native American Religious and other Concerns

Proposed Action

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 Confederated Tribes of the Goshute Reservation, Duckwater Shoshone Tribe, Ely, Shoshone Tribe, Las Vegas Paiute Tribe, Moapa Band of Paiutes, Paiute Indian Tribe of Utah, Koosharem band of Paiute Indians, Kanosh band of Paiute Indians, Shivwits Band of Paiute Indians, Shoshone-Paiute Tribes of the Duck Valley Indian Reservation, Yomba Shoshone Tribe, The Inter-Tribal Council of Nevada, Te-Moak Tribe of Western Shoshone - Elko Band and Moapa Band of Paiutes to identify areas of concern. 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.

Prior to the initiation of any ground disturbing activities, construction, or issuance of an APD, all stipulations, conditions, and/or mitigation measures resulting from consultation and coordination would be followed.

No Action Alternative

The No Action Alternative would have no cumulative impacts to Native American traditional homelands and sacred sites. Current activities adjacent to the proposed parcel would remain on-going as permitted on surrounding federal, state, and private lands.

4.3.7. Wastes, Hazardous and Solid

Proposed Action

Other major activities potentially generating hazardous and solid waste include mining and existing oil and gas exploration, development and production projects. Given the small acreage of oil and gas activity disturbance identified in the RFFD (9,807), as well as any mitigation developed during additional site-specific analysis for oil and gas exploration and development, the contribution to cumulative impacts would be negligible. Also, 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. As discussed in Section 3.3.11, a slight risk of accidental spillage exists, and the consequences of any spill would be greater in wetlands, springs/seeps, riparian areas, floodplains and seasonally flooded playas.

No Action Alternative

Under the No Action Alternative additional hazardous and solid wastes would not be produced and there would be no cumulative effects. Activities on currently leased parcels adjacent to the proposed parcels would remain on-going as permitted on surrounding federal, state, and private lands.

4.3.8. Water Resources: Surface and Ground

Proposed Action

Groundwater Resources

The CESA for groundwater resources encompasses a five-mile radius around the lease parcel representing an area that would contain the water resources most likely to be affected following an APD approval. Impacts to groundwater resources within the CESA have resulted from past and present actions such as grazing, road construction and maintenance, OHV use and recreation, mining and processing activities, aggregate operations, public land management activities, wild horse activity, power lines and other rights of ways, and wildland fire. In addition to the RFFAs listed in Table 4.1, these activities would be expected to continue within the CESA and impacts from these RFFAs to groundwater resources would be like those described for past and present actions. Reclamation of areas disturbed from past and present actions and natural revegetation have helped lessen these impacts.

The cumulative impact to groundwater resources from the incremental impact from parcel development following an APD approval, when added to the past actions, present actions, and RFFAs may add effects like those described in section 3.2.9 above for groundwater. However, lease stipulations and conditions of approval, coupled with compliance with state and federally imposed regulations, would help to minimize the level of these incremental impacts.

No Action Alternative

The No Action Alternative would add no incremental impacts to groundwater resources in the analysis area beyond those occurring under current management. Activities within the CESA would remain on going as permitted on surrounding federal, state, and private lands.

Surface Water Resources

The CESA for surface water resources is expanded relative to the groundwater CESA to include the ephemeral drainages coming off the slopes of the surrounding ranges, which is about an eight- to nine-mile radius encompassing the lease parcel area. Impacts to surface resources within the CESA have resulted from past and present actions such as grazing, road construction and maintenance, OHV use and recreation, mining and processing activities, oil exploration and development, aggregate operations, public land management activities, wild horse activity, power lines and other rights of ways, and wildland fire. In addition to the RFFAs listed in Table 4.1, these activities would be expected to continue within the CESA and impacts from these RFFAs to surface water resources would be like those described for past and present actions. Reclamation of areas disturbed from past and present actions and natural revegetation have helped lessen these impacts.

The cumulative impact to surface water resources from the incremental impact from parcel development following an APD approval, when added to the past actions, present actions, and RFFAs, may add effects like those described above in section 3.2.3 for surface water. However, lease stipulations and conditions of approval, coupled with compliance with state and federally imposed regulations, would help to minimize the level of these incremental impacts.

No Action Alternative

The No Action Alternative would add no incremental impacts to surface water resources in the analysis area beyond those occurring under current management. Activities within the CESA would remain on going as permitted on surrounding federal, state, and private lands.

4.3.9. Vegetation Resources

Proposed Action

The Cumulative Effects Study Area (CESA) for Vegetation Resources will consist of the area within Lake Valley, Nevada. The disturbance associated with oil and gas exploration and production would add to existing and future disturbances within this CESA, from mining exploration, mine development, grazing management, wildfires, fire rehabilitation, range improvement projects, and previous geothermal exploration. Creating new roads, constructing drill pads and developing wells removes available vegetation and increases 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, indirect cumulative impacts of oil and gas exploration and development on vegetation are generally expected to be minimal due to the relatively small area of disturbance in the RFFD timeframe, concurrent reclamation, and development of site-specific mitigation and BMPs.

No Action Alternative

The No Action Alternative would have no cumulative impacts on vegetation resources in the analysis area.

4.3.10. Fish and Wildlife, Special Status Species, Threatened and Endangered Species, Migratory Birds

Proposed Action

The CESA for general wildlife, migratory birds and most special status species (other than greater sage-grouse and aquatic species) consists of a five-mile radius surrounding the parcel. The CESA for greater sage-grouse is the Lincoln Population Management Unit, for aquatic species it is the Lake Valley hydrobasin, and for big game it is hunt unit 231.

Cumulative impacts to fish and wildlife, including special status species and migratory birds, would occur only as a result of the APD approval and subsequent development, and not from the proposed action of offering the lease parcel. Impacts to wildlife within the CESA from past and present actions include agriculture, road construction and maintenance, off-highway vehicle (OHV) use and recreation, exploration, mining and processing activities, aggregate operations, oil and gas exploration and production, geothermal exploration, powerlines and other right-of-ways, public land management activities, livestock grazing, wild horses and wildland fire.

Impacts to wildlife from RFFAs could result from recreation, livestock grazing, agricultural use, road construction and maintenance, exploration, aggregate operations, public land management activities, wild horses, and wildland fire. A cumulative indirect impact resulting from groundwater use and consumption for mining, oil and gas development, and agriculture can indirectly affect all wildlife species, in particularly aquatic species.

The cumulative impacts on wildlife from the incremental impact of the proposed action when added to the past actions, present actions, and RFFAs would be the additional loss of habitat, habitat fragmentation, displacement, and loss of some individuals. Cumulative impacts to general wildlife were addressed in the 2007 Ely District PRMP/FEIS on pages 4.28-35 – 4.28-37. Cumulative impacts to special status species were addressed in the 2007 Ely District PRMP/FEIS on pages 4.28-38 – 4.28-43. Stipulations applied to the lease parcels would minimize impacts to wildlife.

No Action Alternative

The No Action Alternative would have no additional impact to fish and wildlife, special status species, or migratory birds. Activities on currently leased parcels adjacent to the proposed parcel would remain on-going as permitted on surrounding federal, state, and private lands.

4.3.11. Visual Resource Management

Proposed Action

The actual sale of this parcel could incrementally have cumulative impacts on VRM. If resources are discovered, and the parcel were to go into production it would more than likely lead to additional parcels being leased that could potentially go into production. Even with design features and mitigation incorporated there could potentially be negative cumulative impacts to VRM. Large-scale production or an oil and gas field within the area would be seen, would attract attention, and would dominate the view, which would require an RMP amendment with a VRM Class adjustment from Class III to Class IV.

No Action Alternative

The No Action Alternative would have no cumulative impacts to VRM.

4.3.12. Livestock Grazing

Proposed Action

The Cumulative Effects Study Area (CESA) for the Livestock Grazing Resource will include the area within the Geyser Ranch grazing allotment. The Proposed Action would result in cumulative impacts to livestock grazing if an APD is approved and development proceeds. The primary indirect impact would be a potential loss of forage. Appendix B, Table B2 shows that approximately 8.69% of Pasture #7 of Geyser Ranch allotment has the potential for short term and/or long-term disturbances associated with the RFFD of the Proposed Action. These disturbances would become direct effects if an APD is approved

and development proceeds. Incremental and direct cumulative impacts would be analyzed in an additional site-specific NEPA process for any development scenario.

No Action Alternative

The No Action Alternative would have no cumulative impacts to livestock grazing.

4.3.13. Geology and Mineral Extraction

Proposed Action

Exploration and development for locatable minerals, mineral materials, and leasable minerals have occurred near the nominated lands. The RFFD assumes permitting an average of 22 wells for 420 acres of short-term disturbance and 70 acres of long-term disturbance each year since 2008. Therefore, 352 wells and 6,720 acres of short-term disturbance and 1,120 acres of long-term disturbance are assumed to have occurred since 2008. The state of Nevada had only approved 104 APDs between 2008 and 2022. If 22 wells are permitted as a result of offering these parcels for sale, the total number of wells would be well below the anticipated 352 as described by the RFFD (BLM, 2007). Given the lack of recent oil and gas well drilling in the Ely District, the predicted cumulative impact that could potentially result from development of the nominated lands are likely minor to negligible.

No Action Alternative

The No Action Alternative would have no cumulative impacts to geology and mineral extraction in the area. Activities on currently leased parcels adjacent to the proposed parcels would remain on-going as permitted on surrounding federal, state, and private lands.

Chapter 5. Consultation and Coordination

5.1. Individuals, Organizations, and Tribes Consulted

5.1.1. Individuals and Organizations

The BLM consulted with the following individuals and Organizations prior to the Public Comment Period:

Nevada Department of Wildlife
United States Fish and Wildlife Service

5.1.2. Tribes

The BLM Ely District Office, Bristlecone Field Office, reached out to federally recognized tribal governments, in compliance with Executive Order 13175 Consultation and Coordination with Indian Tribal Governments, by sending notification letters seeking input and inviting tribes to consultation on January 24, 2024. The following Tribes were sent notification letters:

Confederated Tribes of the Goshute Reservation
Duckwater Shoshone Tribe
Ely Shoshone Tribe
Las Vegas Paiute Tribe
Moapa Band of Paiutes
Paiute Indian Tribe of Utah
Koosharem band of Paiute Indians
Kanosh band of Paiute Indians
Shivwits Band of Paiute Indians
Shoshone-Paiute Tribes of the Duck Valley Indian Reservation
Yomba Shoshone Tribe
The Inter-Tribal Council of Nevada
Te-Moak Tribe of Western Shoshone - Elko Band
Moapa Band of Paiutes

Chapter 6. List of Preparers

Table 6.1 List of BLM Preparers

Name	Title	Responsible for the Following Resources
Andrew Gault	Hydrologist	Soil Resources: Prime and Unique, Floodplains, Water Resources: Surface and Ground, Wetlands and Riparian Zones
Frank Giles	Air Resource Specialist	Air Resources, Climate Change
Nancy Herms	Wildlife Biologist	Threatened and Endangered Species, Fish and Wildlife, Migratory Birds, Special Status Animal Species
Stacy Holt	Natural Resources Specialist	Reclamation
John Miller and Leslie Phillips	Recreation Specialist	Recreation, Lands with Wilderness Characteristics, Visual Resource Management
Aaron Banes	Geologist	Geology and Mineral Extraction
Matt Fockler	Socioeconomic Specialist	Environmental Justice and Socioeconomic Concerns
Maureen McDonald	Realty Specialist	Lands And Realty
Michael Eytchison	Rangeland Management Specialist	Livestock Grazing and Vegetation Resources
Harry Konwin	Archaeologist	Cultural Resources, Heritage Special Designations, Paleontology
Elizabeth Nash	Native American Tribal Coordinator	Native American Religious Concerns, Tribal Coordination
Concetta Brown	Planning and Environmental Coordinator	Project Manager

Chapter 7. References

43 CFR, 2009. Title 43 Code of Federal Regulations, Part 1000 to End.

Anna, L. O., Roberts, L. N., and Potter, C. J., 2007, Geologic assessment of undiscovered oil and gas in the Paleozoic-Tertiary composite total petroleum system of the Eastern Great Basin, Nevada and Utah: U.S. Geological Survey Digital Data Series DDS-69-L, v. 2, 50 p.

BLM 2007. Ely Proposed Resource Management Plan/Final Environmental Impact Statement. November, 2007. USDI-BLM. Ely District Office.

BLM 2008a. Ely District Record of Decision and Approved Resource Management Plan. United States Department of the Interior, Bureau of Land Management, Ely District: Ely, Nevada. August 2008.

BLM 2017. United States Department of the Interior Bureau of Land Management Preliminary Environmental Assessment. December 2017 Competitive Oil and Gas Lease Sale. DOI-BLM-NV-L030-2017-0021-EA. Available online: [https://eplanning.blm.gov/epl-front-office/projects/nepa/85574/137283/167637/2017O&G_EA_FINAL-20170926_\(2\)_508.pdf](https://eplanning.blm.gov/epl-front-office/projects/nepa/85574/137283/167637/2017O&G_EA_FINAL-20170926_(2)_508.pdf). BLM

2018. United States Department of the Interior Bureau of Land Management Final Environmental Assessment. December 2018 Competitive Oil and Gas Lease Sale. DOI-BLM-NV-L000-2018-0002-EA. Available online: https://eplanning.blm.gov/epl-front-office/projects/nepa/112280/160464/196208/DOI-BLM-NV-L000-2018-0002-EA_Final.pdf.

BLM and USDA, Forest Service, 2006. Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development, The Gold Book: Fourth Edition.

BLM 2023. *2022 BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends*. Retrieved from <https://www.blm.gov/content/ghg/2022> BLM. (2023). *2022 BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends*. Retrieved from <https://www.blm.gov/content/ghg/2022>

BLM 2023. Bureau of Land Management Nevada Special Status Species List, updated September 2023.

EPA (2001) Visibility in Mandatory Federal Class I Areas (1994–1998): A Report to Congress, Introduction to Visibility Issues <https://www.epa.gov/sites/default/files/2015-05/documents/chap01.pdf>

EPA. (2022, 4 28). *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2020*. Retrieved from <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2020>

U.S. Environmental Protection Agency (EPA). 2021a. Health Effects Notebook for Hazardous Air Pollutants Available at: <https://www.epa.gov/haps/health-effects-notebook-hazardous-air-pollutants>. Accessed November 2022.

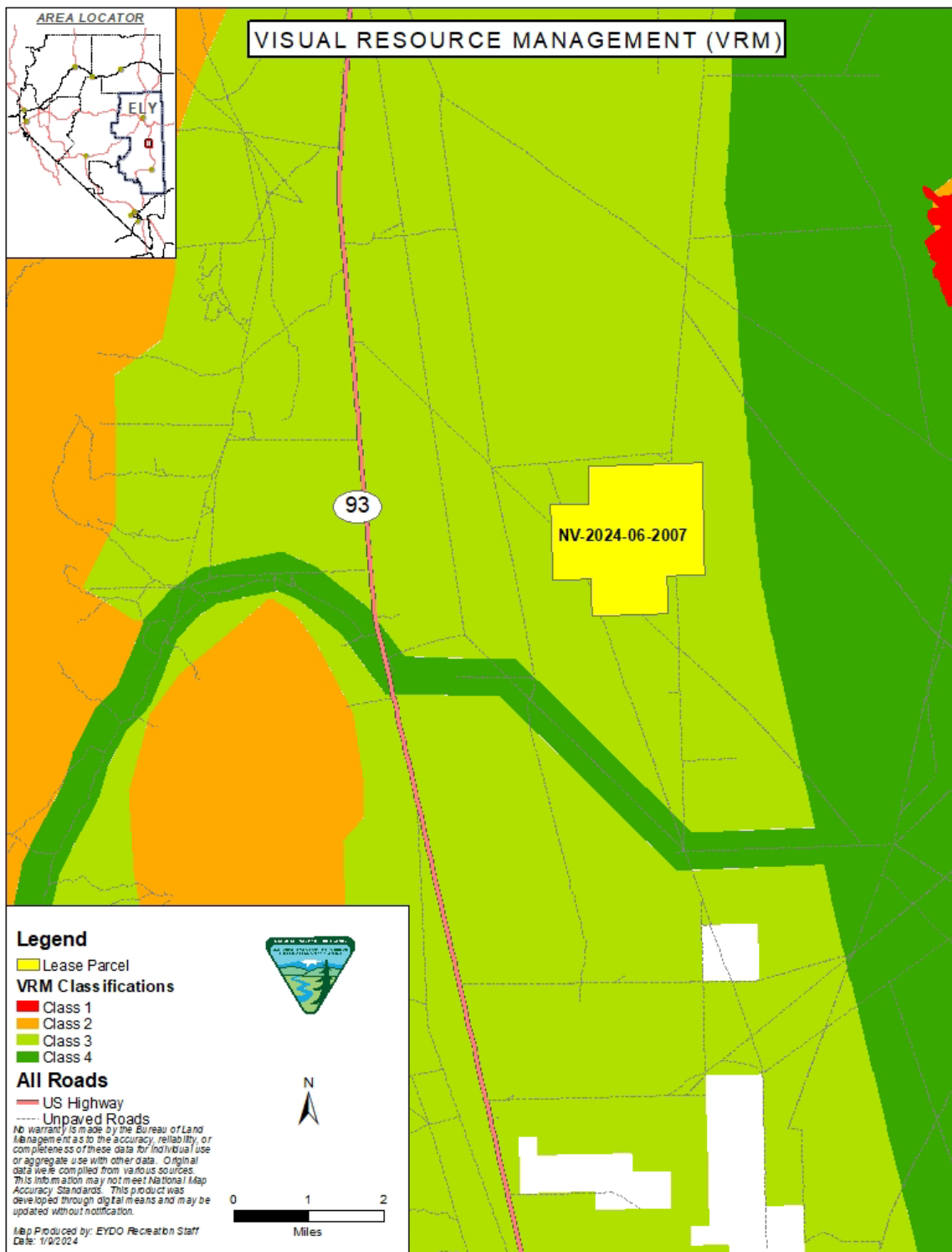
———. 2022a. Ground-level Ozone Pollution. Available at: <https://www.epa.gov/ground-level-ozone-pollution>. Accessed November 2022.

- . 2022b. Health and Environmental Effects of Particulate Matter (PM). Available at: <https://www.epa.gov/pm-pollution/particulate-matter-pm-basics>. Accessed November 2022.
- . 2022c. Basic Information about NO₂. Available at: <https://www.epa.gov/no2-pollution/basic-information-about-no2>. Accessed November 2022.
- . 2022d. Basic Information about Carbon Monoxide (CO) Outdoor Air Pollution. Available at: <https://www.epa.gov/co-pollution/basic-information-about-carbon-monoxide-co-outdoor-air-pollution#Effects>. Accessed November 2022.
- . 2022e. Basic Information about Lead Air Pollution. Available at: <https://www.epa.gov/lead-air-pollution/basic-information-about-lead-air-pollution#health>. Accessed November 2022.
- . 2022f. Sulfur Dioxide Basics. Available at: <https://www.epa.gov/so2-pollution/sulfur-dioxide-basics#effects>. Accessed November 2022.
- IWG 2021. Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide: Interim Estimates under Executive Order 13990. Interagency Working Group on the Social Cost of Greenhouse Gases. Available online: [2021-09679.pdf \(federalregister.gov\)](https://www.federalregister.gov/documents/2021/09/27/2021-09679). Accessed 15 February, 2023.
- Muntean J.L. & Davis D.A., 2021. Nevada active mines and energy producers. Accessed at: <https://pubs.nbmng.unr.edu/NV-active-mines-and-energy-2021-p/of2021-01.htm>
- NDWR 2024a. Nevada Division of Water Resources. Nevada Department of Natural Resources and Conservation. Evapotranspiration and Net Irrigation Water Requirements. Available online: water.nv.gov/Evapotranspiration.aspx. Accessed 12 January 2024.
- . 2024b. Nevada Division of Water Resources. Nevada Department of Natural Resources and Conservation. Underground Active Basin Summaries. Available online: water.nv.gov/UndergroundActive.aspx. Accessed 12 January 2024.
- . 2024c. Nevada Division of Water Resources. Nevada Department of Natural Resources and Conservation. Water Rights Mapping Application. Available online: [Water Rights Mapping Application \(nv.gov\)](https://water.nv.gov/WaterRightsMappingApplication.aspx). Accessed 12 January 2024.
- . 2024d. Nevada Division of Water Resources. Nevada Department of Natural Resources and Conservation. Nevada Hydrology Data. Available online: [NV Hydrology](https://water.nv.gov/NVHydrology.aspx). Accessed 12 January 2024.
- NRCS 2004. Teebone-Yobe Association Map Unit Description. National Resource Conservation Service. United States Department of Agriculture. Accessed via the NRCS Web Soil Survey. Available online: [Web Soil Survey \(usda.gov\)](https://websoilsurvey.sc.egov.usda.gov/) Accessed 16 January 2024.
- NRCS 2007. Rangeland Ecological Site Description. Technical Guide Section IIE. ESD Code R028AY008NV. National Resource Conservation Service. United States Department of Agriculture.
- NRCS 2024. Web Soil Survey. Webmap soils mapping tool. National Resource Conservation Service. United States Department of Agriculture. Available online: [Web Soil Survey \(usda.gov\)](https://websoilsurvey.sc.egov.usda.gov/) Accessed 16 January 2024.
- USFWS 2023. National Wetlands Inventory Surface Waters and Wetlands mapping tool. United States Department of Interior. Available online: [National Wetlands Inventory \(usgs.gov\)](https://wetlands.fws.gov/). Accessed 19 February 2023.

WRCC, 2024. Station Map Viewer. Western Regional Climate Center. Available online: [WRCC - Western Regional Climate Center \(dri.edu\)](https://www.wrcc.dri.edu/). Accessed 16 January 2024.

Welch, A. H., D. J. Bright, and L. A. Knochenmus, Editors. 2007. Water Resources of the Basin and Range Carbonate-Rock Aquifer System, White Pine County, Nevada, and the Adjacent Areas in Nevada and Utah: U.S. Geological Survey Scientific Investigations Report 2007-5261. 96 pp.

Appendix A-Maps



Map 3. VRM analysis map for the proposed parcel.

Appendix B-Supporting Tables

Table B1. BLM Special Status Species (BLM 2023)*

Common Name	Scientific Name
Golden eagle	<i>Aquila chrysaetos</i>
Sagebrush sparrow	<i>Artemisiospiza nevadensis</i>
Short-eared owl	<i>Asio flammeus</i>
Western burrowing owl	<i>Athene cunicularia hypugaea</i>
Ferruginous hawk	<i>Buteo regalis</i>
Swainson's hawk	<i>Buteo swainsoni</i>
Greater sage-grouse	<i>Centrocercus urophasianus</i>
Common nighthawk	<i>Chordeiles minor</i>
Pinyon jay	<i>Gymnorhinus cyanocephalus</i>
Cassin's finch	<i>Haemorhous cassinii</i>
Bald eagle	<i>Haliaeetus leucocephalus</i>
Loggerhead shrike	<i>Lanius ludovicianus</i>
Long-billed curlew	<i>Numenius americanus</i>
Sage thrasher	<i>Oreoscoptes montanus</i>
Broad-tailed hummingbird	<i>Selasphorus platycercus</i>
Black-chinned sparrow	<i>Spizella atrogularis</i>
Brewer's sparrow	<i>Spizella breweri</i>
Northern leopard frog	<i>Lithobates pipiens</i>
Pallid bat	<i>Antrozous pallidus</i>
Pygmy rabbit	<i>Brachylagus idahoensis</i>
Desert pocket mouse	<i>Chaetodipus penicillatus</i>
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>
Desert kangaroo rat	<i>Dipodomys deserti</i>
Spotted bat	<i>Euderma maculatum</i>
Silver-haired bat	<i>Lasionycteris noctivagans</i>
Hoary bat	<i>Lasiurus cinereus</i>
Dark kangaroo mouse	<i>Microdipodops megacephalus</i>
California myotis	<i>Myotis californicus</i>
Western small-footed myotis	<i>Myotis ciliolabrum</i>
Long-eared myotis	<i>Myotis evotis</i>
Long-legged myotis	<i>Myotis volans</i>
Little brown bat	<i>Myotis lucifugus</i>
Fringed myotis	<i>Myotis thysanodes</i>
Canyon bat	<i>Pipistrellus hesperus</i>
Merriam's shrew	<i>Sorex merriami</i>
Brazilian free-tailed bat	<i>Tadarida brasiliensis</i>
Ring-necked snake	<i>Diadophis punctatus</i>
Sonoran Mountain kingsnake	<i>Lampropeltis pyromelana</i>
Greater short-horned lizard	<i>Phrynosoma hernandesi</i>
Lake Valley pyrg	<i>Pyrgulopsis sublata</i>
Parish phacelia	<i>Phacelia parishii</i>
Monarch butterfly	<i>Danaus plexippus</i>

*Parcels would be re-evaluated for potential special status species at the time the BLM receives an APD. This list provides species that may potentially occur during the leasing period.

Table B2. Affected Grazing Allotments in Proposed Action - June 2024 2nd Quarter Oil & Gas Lease Sale Area

Grazing Allotment Name (Allotment Number)	Total Allotment Acreage	Proposed Oil and Gas Parcel ID	Percent of Allotment Affected by Proposed Lease Parcel Overlap	Affected Use Area within Affected Allotment	Total Affected Use Area Acreage	Percent of Affected Use Area Affected by Proposed Lease Parcel Overlap
Geyser Ranch (NV01101)	245,027	NV-2024-06-2007	0.84%	Geyser Ranch Allotment Pasture #7	23,934	8.69%

Appendix C -Nominated Parcel

June 2024 Oil & Gas Preliminary Parcel List

Total Parcel Count: 1

Total Acres: 2080

NV-2024-06-2007

NV, Bureau of Land Management, PD

T. 7 N., R. 66 E., MOUNT DIABLO

Sec. 4 S1/2;

Sec. 5 SE1/4;

Sec. 8 ALL;

Sec. 9 ALL;

Sec. 16 NW1/4;

Sec. 17 NE1/4.

Lincoln County

2080 Acres

EOI# NV00018419

Appendix D-Stipulations and Lease Notices

Stipulations and Lease Notices

Stipulations are restrictions that are included in the current applicable land use plan – the Ely District RMP.

Lease Notices serve to inform prospective lessees of other regulatory authorities that may apply to a parcel.

BLM Nevada Standard Lease Notices (#NV-L-00-A-LN)

These stipulations and notices apply to all parcels all lands and represent standard Best Management Practices for ensuring compliance with extant Federal Laws and resource protection.

Migratory Birds

The Operator is responsible for compliance with provisions of the Migratory Bird Treaty Act by implementing measures to prevent take of migratory birds. Operators should be aware that any ground clearing or other disturbance (such as creating cross-country access to sites, drilling, and/or construction) during the migratory bird (including raptors) nesting season (March 1 - July 31) risks a violation of the Migratory Bird Treaty Act. Disturbance to nesting migratory birds should be avoided by conducting surface disturbing activities outside the migratory bird nesting season.

If surface disturbing activities must be implemented during the nesting season, a preconstruction survey for nesting migratory birds should be performed by a qualified wildlife biologist, during the breeding season (if work is not completed within a specified time frame, then additional surveys may be needed). If active nests are found, an appropriately-sized no surface disturbance buffer determined in coordination with the BLM biologist should be placed on the active nest until the nesting attempt has been completed.

If no active nests are found, construction activities must occur within the survey validity time frame specified in the conditions of approval.

Fossils

This area has low to moderate potential for vertebrate paleontological resources, unless noted to have higher potential in a separate stipulation. This area may contain vertebrate paleontological resources. Inventory and/or on-site monitoring during disturbance or spot checking may be required of the operator. In the event that previously undiscovered paleontological resources are discovered in the performance of any surface disturbing activities, the item(s) or condition(s) will be left intact and immediately brought to the attention of the authorized officer of the BLM. Operations within 250 feet of any such discovery will not be resumed until written authorization to proceed is issued by the Authorized Officer. The lessee will bear the cost of any required paleontological appraisals, surface collection of fossils, or salvage of any large conspicuous fossils of significant scientific interest discovered during the operations.

Water

The Operator is responsible for compliance with provisions of the Clean Water Act, Safe Drinking Water Act, and applicable State laws and regulations regarding protection of state water resources. Operators should contact Nevada Division of Water Resources and Nevada Division of Environmental Protection regarding necessary permits and compliance measures for any construction or other activities.

Mining Claims

This parcel may contain existing mining claims and/or mill sites located under the 1872 Mining Law. To the extent it does, the oil and gas lessee must conduct its operations, so far as reasonably practicable, to avoid damage to any known deposit of any mineral for which any mining claim on this parcel is located, and should not endanger or unreasonably or materially interfere with the mining claimant's operations, including any existing surface or underground improvements, workings, or facilities which may have been made for the purpose of mining operations. The provisions of the Multiple Mineral Development Act (30 U.S.C. 521 et seq.) shall apply on the leased lands.

Fire

The following precautionary measures should be taken to prevent wildland fires. In the event your operations should start a fire, you could be held liable for all suppression costs.

- All vehicles should carry fire extinguishers and a minimum of 10 gallons of water.
- Adequate fire-fighting equipment i.e. shovel, Pulaski, extinguisher(s) and a minimum 10 gallons of water should be kept at the drill site(s).
- Vehicle catalytic converters should be inspected often and cleaned of all brush and grass debris.
- When conducting welding operations, they should be conducted in an area free from or mostly free from vegetation. A minimum of 10 gallons water and a shovel should be on hand to extinguish any fires created from the sparks. Extra personnel should be at the welding site to watch for fires created by welding sparks.
- Report wildland fires immediately to the BLM Eastern Nevada Interagency Dispatch Center at (775) 289-1925. Helpful information to report is location (latitude and longitude if possible), what's burning, time started, who/what is near the fire and direction of fire spread.
- When conducting operations during the months of June through September, the operator must contact the BLM Ely District Office, Division of Fire and Aviation at (775 289-1925) to find out about any fire restrictions in place for the area of operation and to advise this office of approximate beginning and ending dates for your activities.

Parcel #	Legal Land Description
ALL	ALL LANDS

HQ-MLA-1

Notice to Lessee Concerning Mineral Leasing Act Section 2 (A)(2)(A)

Provisions of 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).

In accordance with the terms of this oil and gas lease with respect to compliance by the initial lessee with qualifications concerning Federal coal lease holdings, all assignees and transferees are hereby notified that this oil and gas lease is subject to cancellation if: (1) the initial lessee as assignor or as transferor has falsely certified compliance with Section 2(a)(2)(A) because of a denial or disapproval by a State Office of a pending coal action, i.e., arms-length assignment, relinquishment, or logical mining unit; (2) the initial lessee as assignor or as transferor is no longer in compliance with Section 2(a)(2)(A); or (3) the assignee or transferee does not qualify as

a bona fide purchaser and, thus, has no rights to bona fide purchaser protection in the event of cancellation of this lease due to noncompliance with Section 2(a)(2)(A).

The lease case file, as well as in other Bureau of Land Management (BLM) records available through the State Office issuing this lease, contains information regarding assignor or transferor compliance with Section 2(a)(2)(A).

Parcel #	Legal Land Description
ALL	ALL LANDS

HQ-CR-1

Cultural Resource Protection

This lease may be found to contain historic properties and/or resources protected under National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any

ground-disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may 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.

Parcel #	Legal Land Description
ALL	ALL LANDS

HQ-TES-1

Threatened and Endangered Species Act

The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. The BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that would contribute to a need to list such a species or their habitat. The BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. The BLM will not approve any ground-disturbing activity until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 U.S.C. §1531 et seq. including completion of any required procedure for conference or consultation.

Parcel #	Legal Land Description
ALL	ALL LANDS

Appendix E-Ely District Best Management Practices for Oil & Gas

Air Resources

- Use dust abatement techniques on unpaved, un-vegetated surfaces to minimize airborne dust.
- Post and enforce speed limits (e.g., 25 miles per hour) to reduce airborne fugitive dust.
- Cover construction materials and stockpiled soils if they are a source of fugitive dust.
- Use dust abatement techniques before and during surface clearing, excavation, or blasting activities.

Water Resources

- Avoid the application of fire retardant or foam within 300 feet of a stream channel or waterway, when possible, except for the protection of life and property. Aerial application and use of retardants and foams would be consistent with national policy guidelines established by the National Office of Fire and Aviation, as amended.
- Fire engines that have surfactant foam mixes in tanks must be fitted with an anti-siphon (back flow protection valve) if filled directly from a stream channel.
- Construct a containment barrier around all pumps and fuel containers utilized within 100 feet (30.5 meters) of a stream channel. The containment barrier would be of sufficient size to contain all fuel being stored or used on site.
- Prior to use on lands administered by the Ely Field Office, all fire suppression equipment from outside the planning area utilized to extract water from lakes, streams, ponds, or spring sources (e.g., helicopter buckets, draft hoses, and screens) will be thoroughly rinsed to remove mud and debris and then disinfected to prevent the spread of invasive aquatic species. Rinsing equipment with disinfectant solution will not occur within 100 feet of natural water sources (i.e., lakes, streams, or springs). Ely suppression equipment utilized to extract water from water sources known to be contaminated with invasive aquatic species, as identified by the U.S. Fish and Wildlife Service and Nevada Department of Wildlife, also will be disinfected prior to use elsewhere on lands administered by the Ely Field Office.
- Do not dump surfactant foam mixes from fire engines within 600 feet of a stream channel.
- Do not conduct fire retardant mixing operations within 600 feet of a stream channel.
- Remove all modifications made to impound or divert stream flow by mechanical or other means to facilitate extraction of water from a stream for fire suppression efforts when suppression efforts are completed.
- When drafting or dipping water during fire operations, continuously monitor water levels at the site that water is being removed from. Do not allow water extraction to exceed the ability of the recharge inflow to maintain the water levels that exist at the time initial attack efforts began. If the water level drops below this predetermined level, all water removal would cease immediately until water levels are recharged.
- When possible, do not cross or terminate fire control lines at the stream channel. Terminate control lines at the edge of the riparian zone at a location determined appropriate to meet fire suppression objectives based on fire behavior, vegetation/fuel types, and fire fighter safety.
- Construct access roads and fords that cross stream channels to BLM road standards.
- Do not construct new roads or mechanical fire control lines or improve existing roads within 300 feet of a stream channel unless authorized by the BLM Field Manager or Authorized Officer.
- Limit stream crossings on travel routes and trails to the minimal number necessary to minimize sedimentation and compaction. The BLM Authorized Officer will determine if any impacts need to be rehabilitated by the permittee.
- Conduct mixing of herbicides and rinsing of herbicide containers and spray equipment only in areas that are a safe distance from environmentally sensitive areas and points of entry to bodies of water (storm drains, irrigation ditches, streams, lakes, or wells).
- A water well may be accepted by the BLM Ely Field Office upon completion of operations. The BLM authorized officer will make the determination whether to accept the well based upon the submission of the well completion forms and relevant hydrogeologic data reports. The well must be installed by drillers licensed by the state of Nevada according to specifications in Nevada Revised Statutes Title 48, Chapter 534.

Soil Resources

- Require the use of specialized low-surface impact equipment (e.g., balloon tired vehicles) or helicopters, as determined by the BLM Authorized Officer, for activities in off-road areas where it is deemed necessary to protect fragile soils and other resource values.
- During periods of adverse soil moisture conditions caused by climatic factors such as thawing, heavy rains, snow,

flooding, or drought, suspend activities on existing roads that could create excessive surface rutting. When adverse conditions exist, the operator would contact the BLM Authorized Officer for an evaluation and decision based on soil types, soil moisture, slope, vegetation, and cover.

- When preparing the site for reclamation, include contour furrowing, terracing, reduction of steep cut and fill slopes, and the installation of water bars, as determined appropriate for site- specific conditions.
- Upon completion or temporary suspension of mining operations, backfill all holes and trenches and re-contour the pit to the natural slope, if possible, with pit walls greater than 3 feet in height knocked down and sloped at 3 horizontal to 1 vertical or to the original topography, whichever is less.
- Restoration requirements include reshaping, re-contouring, and/or resurfacing with topsoil, installation of water bars, and seeding on the contour. Removal of structures such as culverts, concrete pads, cattle guards, and signs would usually be required. Fertilization and/or fencing of the disturbance may be required. Additional erosion control measures (e.g., fiber matting and barriers) to discourage road travel may be required.

Vegetation Resources

- Where seeding is required, use appropriate seed mixture and seeding techniques approved by the BLM Authorized Officer.
- The BLM Authorized Officer will specify required special handling and recovery techniques for Joshua trees, yucca, and some cactus in the southern part of the planning area on a site- specific basis.
- Keep removal and disturbance of vegetation to a minimum through construction site management (e.g., using previously disturbed areas and existing easements, limiting equipment/materials storage and staging area sites, etc.).
- Generally, conduct reclamation with native seeds that are representative of the indigenous species present in the adjacent habitat. Document rationale for potential seeding with selected nonnative species. Possible exceptions would include use of nonnative species for a temporary cover crop to out-complete weeds. In all cases, ensure seed mixes are approved by the BLM Authorized Officer prior to planting.
- Certify that all interim and final seed mixes, hay, straw, and hay/straw products are free of plant species listed on the Nevada noxious weed list.
- An area is considered to be satisfactorily reclaimed when all disturbed areas have been recontoured to blend with the natural topography, erosion has been stabilized, and an acceptable vegetative cover has been established. Use the Nevada Guidelines for Successful Revegetation prepared by the Nevada Division of Environmental Protection, the BLM, and the U.S. Department of Agriculture Forest Service (or most current revision or replacement of this document) to determine if revegetation is successful.
- Reclamation bond release criteria would include the following:
- The perennial plant cover of the reclaimed area would equal or exceed perennial cover of selected comparison areas (normally adjacent habitat). If the adjacent habitat is severely disturbed, an ecological site description may be used as a cover standard. Cover is normally crown cover as estimated by the point intercept method. Selected cover can be determined using a method as described in Sampling Vegetation Attributes, Interagency Technical Reference, 1996, BLM/RS/ST-96/002+1730. The reclamation plan for the area project would identify the site-specific release criteria and associated statistical methods in the reclamation plan or permit.
- Utility companies will manage vegetation in their rights-of-way for safe and reliable operation while maintaining vegetation and wildlife habitat.
- Re-spread weed-free vegetation removed from the right-of-way to provide protection, nutrient recycling, and seed source.

Fish and Wildlife

- Install wildlife escape ramps in all watering troughs, including temporary water haul facilities, and open storage tanks. Pipe the overflow away from the last water trough on an open system to provide water at ground level.
- As appropriate, mark certain trees on BLM-administered lands for protection as wildlife trees.
- Consider seasonal distribution of large wildlife species when determining methods used to accomplish weed and insect control objectives.
- Protect active raptor nests in undisturbed areas within 0.25 mile of areas proposed for vegetation conversion using

species-specific protection measures. Inventory areas containing suitable nesting habitat for active raptor nests prior to the initiation of any project.

- When used to pump water from any pond or stream, screen the intake end of the draft hose to prevent fish from being ingested. Screen opening size would be a maximum of 3/16 inch (4.7 millimeters).
- Special recreation use permittees will take action to ensure that race participants and spectators do not harass wildlife.

Special Status Species

- Avoid line-of-sight views between the power poles along powerlines and sage grouse leks, whenever feasible.
- Use current science, guidelines, and methodologies (Avian Power Line Interaction Committee 1994, 1996, 2005) for all new and existing powerlines to minimize raptor and other bird electrocution and collision potential.
- When managing weeds in areas of special status species, carefully consider the impacts of the treatment on such species. Wherever possible, hand spraying of herbicides is preferred over other methods.
- Do not conduct noxious and invasive weed control within 0.5 mile of nesting and brood rearing areas for special status species during the nesting and brood rearing season.
- To the greatest extent possible, survey all mine adits and shafts slated for closure for bat presence and use prior to being closed. Minimize impacts to bat roosts and bat habitat through the use of current science, guidelines, and methodologies when closing and abandoning mine adits.
- Develop grazing systems to minimize conflicts with special status species habitat.
- For streams currently occupied by any special status species, do not allow extraction of water from ponds or pools if stream inflow is minimal (i.e., during drought situations) and extraction of water would lower the existing pond or pool level.
- When new spring developments are constructed on BLM lands and BLM has the authority to design the project, the source and surrounding riparian area will be fenced, the spring will be developed in a manner that leaves surface water at the source and maintains the associated riparian area, water will be provided outside the enclosure in a manner that provides drinking water for large ungulates, wild horses, and/or livestock so they are less likely to break into the enclosure.
- Salt and mineral supplements:
 - Base placement of salt and mineral supplements on site-specific assessment.
 - Normally place salt and mineral supplements at least 0.5 mile away from riparian areas, sensitive sites, populations of special status plant species, cultural resource sites.
 - Place salt at least 0.5 mile from any water source including troughs.
 - Place salt and mineral supplements at least 1 mile from sage grouse leks.

Water hauling:

- Place water haul sites at least 0.5 mile away from riparian areas, cultural sites, and special status species locations.
- Limit water hauling to existing roads when possible.

Wild Horses

- To protect wild horses and wildlife flag all new fences every 16 feet with white flagging that is at least 1 inch wide and has at least 12 inches hanging free from the top wire of the fence.
- If a project involves heavy or sustained traffic, require road signs for safety and protection of wild horses and wildlife.

Cultural Resources

- Ensure that all activities associated with the undertaking, within 100 meters of the discovery, are halted and the discovery is appropriately protected, until the BLM authorized officer issues a Notice to Proceed. A Notice to Proceed may be issued by the BLM under any of the following conditions:
 - Evaluation of potentially eligible resource(s) results in a determination that the resource(s) are not

- eligible;
- The fieldwork phase of the treatment option has been completed; and
- The BLM has accepted a summary description of the fieldwork performed and a reporting schedule for that work.
- The operator will inform all persons associated with the project that knowingly disturbing cultural resources (historic or archaeological) or collecting artifacts is illegal.
- The BLM may approve cross-country operations of seismic trucks and support vehicles on bare frozen ground or over sufficient snow depth (vehicle traffic does not reveal the ground) so as to prevent surface disturbance.
- Perform viewshed reclamation when the setting of a site contributes to the significance of the property.

Paleontological Resources

When paleontological resources of potential scientific interest are encountered (including all vertebrate fossils and deposits of petrified wood), leave them intact and immediately bring them to the attention of the BLM Authorized Officer.

Visual Resources

- On industrial facilities authorized by the Ely Field Office, utilize anti-glare light fixtures to limit light pollution.
- During the implementation of vegetation treatments, create irregular margins around treatment areas to better maintain the existing scenic character of the landscape.
- When feasible, bury utility lines on public land when in the viewshed of residential or community development.

Travel Management and Off-highway Vehicle Use

- Design access roads requiring construction with cut and fill to minimize surface disturbance and take into account the character of the landform, natural contours, cut material, depth of cut, where the fill material would be deposited, resource concerns, and visual contrast. Avoid construction of access roads on steep hillsides and near watercourses where alternate routes provide adequate access.
- Where adverse impacts or safety considerations warrant, limit or prohibit public access when authorizing specific routes to areas or sites under permit or lease.

Recreation

- Do not allow surface or underground disturbance to occur within 100 yards (horizontally or vertically) of known cave resources.
- Where appropriate, do not allow ground disturbing activities within 100 yards of cave entrances, drainage areas, subsurface passages, and developed recreation sites. Do not dispose of waste material or chemicals in sinkholes or gates by cave entrances. If during construction activities any sinkholes or cave openings are discovered, cease construction activities and notify the BLM authorized officer.

Livestock Grazing

- Water troughs
 - Place troughs connected with spring developments outside of riparian and wetland habitats to reduce livestock trampling damage to wet areas.
 - Control trough overflow at springs with float valves or deliver the overflow back into the native channel.
- Based on allotment situations and circumstances associated with livestock grazing and multiple use management, implement any or all of the following appropriate management practices on winterfat dominated ecological sites.
 - Develop grazing systems to control or rest grazing use on winterfat sites after March 1 or when the critical growing season begins. Allow spring grazing use during the critical growing period if a grazing rotation system that provides rest from grazing during the critical growing period at least every other year for all areas is in place. Utilization during the critical growth period should not exceed 35 percent under any circumstances.
 - Place salt and supplements at least 0.5 mile away from winterfat dominated sites. Base placement on site-specific assessment and characteristics such as riparian, topography, cultural, special status species, etc.

- Locate sheep bedding grounds and camps at least 0.5 mile away from winterfat dominated sites. Base placement on site-specific assessment and characteristics such as riparian, topography, cultural, special status species, etc.
- Locate water haul sites at least 0.5 mile away from winterfat dominated sites. Base placement on site-specific assessment and characteristics such as riparian, topography, cultural, special status species, etc.
- Construct livestock reservoirs away from winterfat dominated sites. Base placement on site-specific assessment and characteristics such as riparian, topography, cultural, special status species, etc.
- If water wells are approved to be drilled in winterfat dominated sites, strive to pipe the water at least 0.5 mile away from winterfat dominated sites. Base placement on site-specific assessment and characteristics such as riparian, topography, cultural, special status species, etc.

Mineral Extraction

- Applications for permit to drill would follow the best management practices as outlined in the BLM oil and gas Gold Book <https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/operations-and-production/the-gold-book>), as well as on-shore regulations, individual surface use plans, and conditions of approval that may be part of the Record of Decision for EISs or Decision Records for environmental assessments/Findings of No Significant Impacts, Documentation of NEPA Adequacy, and Categorical Exclusions prepared for site-specific projects.
- Do not permit blasting if it would be detrimental to the significant characteristics of archeological or historical values, recreation areas, known caves, water wells, or springs.
- Notify the BLM authorized officer within 5 days of completion of reclamation work so that timely compliance inspections can be completed.

Watershed Management

Manage activities, uses, and authorizations on burned areas to best meet resource management objectives established for the area in specific stabilization, restoration, or activity plans. The BLM authorized officer may open areas to livestock grazing based upon those considerations.

Fire Management

- Notify valid existing land users (such as mine claimants, holders of rights-of-way, and livestock permittees) prior to implementation of prescribed fires that may affect their investments.
- Remove vegetation, where appropriate, to protect facilities (e.g., range improvements, communication sites, and recreation sites).
- Within the area of operation, every effort will be made to prevent, control, or suppress any fire. Fire-fighting equipment may be required to be on site while operations are in progress, depending on hazards inherent in the type of operation and fire hazard levels. Report uncontrolled fires immediately to the BLM Ely Field Office Manager or Authorized Officer. The BLM Fire Dispatch telephone number is (775) 289-1925 or 1-800-633-6092. After working hours, call 911 or the White Pine County Sheriff's Office at (775) 289-8801, the Lincoln County Sheriff's Office at (775) 962-5151, or the Nye County Sheriff's Office at (775) 482-8101.

Noxious and Invasive Weed Management

- Control or restrict the timing of livestock movement to minimize the transport of livestock-borne noxious weed seeds, roots, or rhizomes between weed-infested and weed-free areas.
- When maintaining unpaved roads on BLM-administered lands, avoid the unnecessary disturbance of adjacent native vegetation and the spread of weeds. Grade road shoulders or barrow ditches only when necessary to provide for adequate drainage. Minimize the width of grading operations. The BLM Authorized Officer will meet with equipment operators to ensure that they understand this objective.

Health and Safety

- Consider nozzle type, nozzle size, boom pressure, and adjuvant use and take appropriate measures for each herbicide application project to reduce the chance of chemical drift.
- All applications of approved pesticides will be conducted only by certified pesticide applicators or by personnel

under the direct supervision of a certified applicator.

- Prior to commencing any chemical control program, and on a daily basis for the duration of the project, the certified applicator will provide a suitable safety briefing to all personnel working with or in the vicinity of the herbicide application. This briefing will include safe handling, spill prevention, cleanup, and first aid procedures.
- Store all pesticides in areas where access can be controlled to prevent unauthorized/untrained people from gaining access to the chemicals.
- Do not apply pesticides within 440 yards (0.25 mile) of residences without prior notification of the resident.
- Areas treated with pesticides will be adequately posted to notify the public of the activity and of safe reentry dates, if a public notification requirement is specified on the label of the product applied. The public notice signs will be at least 8 1/2" x 11" in size and will contain the date of application and the date of safe re-entry.
- The recreation permittee will post warning signs at all known mine shafts and other hazardous areas that occur within 100 feet of a race course or pit/spectator area and will verbally inform race participants of all hazards at the pre-race meeting.
- The recreation permittee will assume liability for and cleanup of any and all releases of hazardous substances or oil (more than one quart) disposed on public land as defined in the National Oil and Hazardous Substances Contingency Plan (Title 40 Code of Federal Regulations Subpart 300). The permittee will immediately notify the BLM Authorized Officer of any and all releases of hazardous substances or oil (more than one quart) on public land.
- Properly dispose of all tailings, dumps, and deleterious materials or substances. Take measures to isolate, control, and properly dispose of toxic and hazardous materials.
- Remove and properly dispose of all trash, garbage, debris, and foreign matter. Maintain the disposal site and leave it in a clean and safe condition. Do not allow burning at the site.
- Do not drain oil or lubricants onto the ground surface. Immediately clean up any spills under 25 gallons; clean up spills over 25 gallons as soon as possible and report the incident to the BLM Authorized Officer and Nevada Division of Environmental Protection.
- The operator will work with the BLM Authorized Officer on the containment of drilling fluids and drillhole cuttings. Adequately fence, post, or cover mud and separation pits, and hazardous material storage areas.
- Locate powder magazines at least 0.25 mile from traveled roads. Attend loaded shot holes and charges at all times. Use explosives according to applicable federal and state regulations.
- Containerize petroleum products such as gasoline, diesel fuel, helicopter fuel, and lubricants in approved containers. Properly store hazardous materials in separate containers to prevent mixing, drainage, or accidents.

Appendix F-Hydraulic Fracturing Technology Paper

This discussion on hydraulic fracturing is derived from the Hydraulic Fracturing (BLM 2013) written and developed by the Bureau of Land Management, Wyoming State Office. It has been modified to meet the criteria for the State of Nevada.

I. BACKGROUND

Hydraulic fracturing (HF) is a well stimulation process used to efficiently maximize the extraction of underground resources – groundwater, oil, natural gas, and geothermal energy. The HF process includes the acquisition of water, mixing of chemicals, surface pressure pumps, production zone fracturing, and HF flowback disposal.

In the United States, HF has been used since the 1940's. Early on, the HF process utilized pressures that are of a much smaller magnitude than those used today.

The HF process involves the injection of a fracturing fluid and propping agent into the hydrocarbon bearing formation under sufficient pressure to widen existing fractures and/or create new fractures. This allows the trapped hydrocarbons an avenue to flow to the wellbore. HF has gained interest recently as hydrocarbons trapped in low permeability or "tight" sand and shale formations are now technically and economically recoverable. As a result, oil and gas production has increased significantly in the United States.

Prior to the development of HF in hydrocarbon bearing tight gas and shale formations, domestic production of conventional resources had been declining. In response to this decline, the federal government in the 1970's through 1992, passed tax credits to encourage the development of unconventional resources. It was during this time that the HF process was further advanced to include the high-pressure multi-stage HF operations being conducted today.

Generally, HF can be described as follows:

- i. Water, proppant, and chemical additives are pumped at extremely high pressures down the wellbore.
- ii. The fracturing fluid is pumped through perforated sections of the wellbore and into the surrounding formation, creating fractures in the rock. The proppant holds the fractures open during well production.
- iii. Company personnel continuously monitor and gauge pressures, fluids and proppants, studying how the proppants reacts when it hits the bottom of the wellbore, slowly increasing the density of proppants to water as HF progresses.
- iv. This process may be repeated multiple times, in "stages" to reach maximum areas of the formation(s). The wellbore is temporarily plugged between each stage to maintain the highest fluid pressure possible for the drill casing and to get maximum fracturing results in the rock.
- v. The plugs are drilled or removed from the wellbore and the well is tested for results.
- vi. The pressure is reduced and the fracturing fluids are returned up the wellbore for disposal or treatment and re-use, leaving the proppant in place to prop open the fractures and allow the oil/gas to flow.

II. OPERATIONAL ISSUES

Wells that undergo HF may be drilled vertically, horizontally, or directionally and the resultant fractures induced by HF can be vertical, horizontal, or both. Wells in Nevada (NV) may extend to depths greater than 10,000 feet or less than 1,000 feet, and horizontal sections of a well may extend several thousand feet from the production pad on the surface. Prior to initiating HF, a cement bond log and pressure test is required and evaluated to ensure the integrity of the cement and its bond to both the well casing and the rock facies around the annulus within the geologic formation.

The total volume of fracturing fluids is generally 95-99% water. The amount of water needed to fracture a well in NV depends on the geologic basin, the formation, and depth and type of well (vertical, horizontal, directional), and the proposed completion process.

In general, approximately 25,000 to 350,000 gallons may be used to fracture shallow vertical wells in NV, while approximately 800,000 to 10 million gallons may be used to fracture deep horizontal or directionally drilled wells in NV.

Proppant, consisting of synthetic or natural silica sand, may be used in quantities of a few hundred tons for a vertical well to a few thousand tons for a horizontal well.

Drilling muds, drilling fluids, water, proppant, and HF fluids are stored in onsite tanks or lined pits during the drilling and/or completion process. Equipment transport and setup can take several days, and the actual HF and flowback process can occur in a few days up to a few weeks. For oil wells, the flowback fluid from the HF operations is treated in an oil-water separator before it is stored in a lined pit or tank located on the surface. Where gas wells are flowed back using a “green completion process” fluids are run through a multi-phase separator, which are then piped directly to enclosed tanks or to a production unit. Nevada currently does not have any gas production, but this may change, if gas rich formations are discovered.

Gas emissions associated with the HF process, such as methane, carbon dioxide, and volatile organic compounds (VOCs), are captured when the operator utilizes a green completion process. A “green completion process” is where the operator captures gases at the well head immediately after the well is completed. Where a green completion process is not utilized, gas emissions associated with the well may be vented and/or flared until “saleable quality” product is obtained in accordance with federal and state rules and regulations. The total volume of emissions from the equipment used (trucks, engines) will vary based on the pressures needed to fracture the well, and the number of zones to be fractured.

Under either completion process, wastewaters from HF may be disposed in several ways. For example, the flowback fluids may be stored in tanks pending reuse; the resultant waste may be re-injected using a permitted injection well, or the waste may be hauled to a licensed facility for treatment, disposal and/or reuse.

Disposal of the waste stream following establishment of “sale-quality” product, would be handled in accordance with Onshore Order #7 regulations and other state/federal rules and regulations.

Fracturing Fluids

As indicated above, the fluid used in the HF process is approximately 95 to 99 percent water and proppants, and 1-5 percent of special-purpose chemical additives. There is a broad array of chemicals that can be used as additives in a fracture treatment including, but not limited to, hydrochloric acid, anti-bacterial agents, corrosion inhibitors, gelling agents (polymers), surfactants, and scale inhibitors. The 1 to 5 percent of chemical additives translates to a minimum of 15,000 gallons of chemicals for every 1.5 million gallons of water used to fracture a well (Paschke, Dr. Suzanne. USGS, Denver, Colorado. September 2011). Water used in the HF process is generally acquired from surface water or groundwater in the local area. Information on obtaining water and water rights is discussed below.

The Nevada Division of Minerals (NDOM) has regulations that require the reporting of the amount and type of chemicals used in a HF operation in “FracFocus” within 60 days of HF completion for public disclosure. For more information concerning FracFocus and HF, refer to the FracFocus website at www.fracfocus.org and the NDOM website at minerals.state.nv.us.

Re-Fracturing

Re-fracturing of wells (RHF) may be performed after a period of time to restore declining production rates. RHF success can be attributed to enlarging and reorienting existing fractures while restoring conductivity due to proppant degradation and fines plugging. Prior to RHF, the wellbore may be cleaned out. Cleaning out the wellbore may recover over 50% of

the initial proppant sand. Once cleaned, the process of RHF is the same as the initial HF. The need for RHF cannot be predicted.

Water Availability and Consumption Estimates

According to the Nevada State Water Plan (March 1999), total statewide water withdrawals for NV are forecasted to increase about 9 percent from 4,041,000 acre-feet (af) in 1995 to 4,391,000 acre-feet in 2020, assuming current levels of conservation. Approximately one-half of these withdrawals are consumptively used. This projected increase in water use is directly attributable to Nevada's increasing population and related increases in economic endeavors.

The anticipated rise in total statewide water withdrawals primarily reflects expected increases in public supply for municipal and industrial (M&I) water usage to meet the needs of a growing urban population, with expanding commercial and industrial activities. Nevada's population is projected to reach about 3,047,000 by the year 2020, with about 95 percent of these residents served by public water systems (NDWP, March 1999).

M&I withdrawals currently account for about 13 percent of the water used in NV. About 77 percent of water withdrawals are currently for agricultural use. Annual M&I water use is projected to increase from 525,000 af in 1995 to 1,034,000 af in 2020 (24 percent of total water withdrawals) based upon existing water use patterns and conservation measures. Approximately 6 to 7 percent of statewide water withdrawals occur in the mining industry (NDWP, March 1999).

Interest in obtaining the necessary water supplies for wildlife and environmental needs is increasing. Additionally, the popularity of water-based outdoor recreation continues to grow. It is anticipated that these trends will continue, resulting in increased water supply demands for wildlife, environmental and recreational purposes.

Currently, surface water supplies are virtually fully appropriated. The increase in total statewide demand, particularly M&I water use, is expected to be met via better demand management (conservation), use of alternative sources (reused water, reclaimed water and gray water), purchases, leases or other transfers from existing water users, and by new groundwater appropriations. Much of the state's unappropriated groundwater is located in basins at a distance from urban centers. Thus, increasing attention will be placed on interbasin and intercounty transfers, and implementation of underutilized water management tools such as water marketing and water banking. Water for instream flow purposes, wildlife protection, environmental purposes and recreation will likely be generated by increased conservation and the acquisition of existing water rights (NDWP, March 1999).

Comparison Figures:

- Olympic-sized swimming pool - **660,430 gallons** of water.
- Typical golf course requires **100,000 to 1,000,000 gallons** of water per week in summer to maintain healthy vegetation.
- Average car wash of fresh water uses **9 to 15 gallons** during any given wash cycle.
- Average household in Southern Nevada uses about **222 gallons** of water per day (**81,000 gallons** per year).

Potential Sources of Water for Hydraulic Fracturing

Quality freshwater is required to drill the surface-casing section of the wellbore per Federal regulations; other sections of the wellbore (intermediate and/or production strings) would be drilled with appropriate quality makeup water as necessary. This is done to protect usable water zones from contamination, to prevent mixing of zones containing different water quality/use classifications, and to minimize total freshwater volumes. With detailed geologic well logging during drilling operations, geologists/mud loggers on location identify the bottoms of these usable water zones, which aids in the proper setting of casing depths. Usable water is defined as having less than 10,000 mg/l of Total Dissolved Solids (TDS). Drinking or potable water is defined as having less than 1,000 mg/l of TDS.

Several sources of water are available for drilling and/or HF in NV. Nevada's water rights system is based on the prior appropriation doctrine; therefore, all use of water, with the exception of domestic wells, requires a permit from the State

Engineer (NRS 534.180). Like any other water user, companies that drill or hydraulically fracture oil and gas wells must adhere to NV water laws when obtaining and using specific sources of water.

Below is a discussion of the sources of water that could potentially be used for HF. The decision to use any specific source is dependent on BLM authorization at the APD stage and the ability to obtain water rights. From an operators' standpoint, the decision regarding which water source will be used is primarily driven by the economics associated with procuring a specific water source.

Water transported from outside the state. The operator may transport water from outside the state. As long as the transport and use of the water carries no legal obligation to NV, this is an allowable source of water from a water rights perspective.

Irrigation water leased or purchased from a landowner. The landowner may have rights to surface water, delivered by a ditch or canal that is used to irrigate land. The operator may choose to enter into an agreement with the landowner to purchase or lease a portion of that water. This is allowable, however, in nearly every case, the use of an irrigation water right is likely limited to irrigation uses and cannot be used for well drilling and HF operations. To allow its use for drilling and HF, the owner of the water right and the operator must apply to change the water right through a formal process.

Treated water or raw water leased or purchased from a water provider or municipality. The operator may choose to enter into an agreement with a water provider to purchase or lease water from the water provider's system. Municipalities and other water providers may have a surplus of water in their system before it is treated (raw water) or after treatment that can be used for drilling and HF operations. Such an arrangement would be allowed only if the operator's use were compliant with the water provider's water rights.

Water treated at a waste water treatment plant leased or purchased from a water provider. The operator may choose to enter into an agreement with a water provider to purchase or lease water that has been used by the public and then treated as wastewater. Municipalities and other water providers discharge their treated waste water into the streams where it becomes part of the public resource, ready to be appropriated once again in the priority system. But for many municipalities a portion of the water that is discharged has the character of being "reusable." As a result, it is possible that after having been discharged to the stream, it could be diverted by the operator to be used for drilling and HF operations. Such an arrangement would only be appropriate with the approval of the Nevada Division of Water Resources, State Engineer's Office (NDWR) and would be allowed only if the water provider's water rights include uses for drilling and HF operations.

New diversion of surface water flowing in streams and rivers. New diversion of surface waters in most parts of the state are rare because the surface streams are already fully appropriated, meaning that there is no water available for appropriation. Given the variability of surface water flows in the State, this may not be the most reliable water source even if there is water available for appropriation.

Produced Water. The operator may choose to use water produced in conjunction with oil or gas production at an existing oil or gas well. The water that is produced from an oil or gas well is under the administrative purview of the NDEP, Underground Injection Control Program (UIC) and is either non-tributary, in which case, it is administered independent of the prior appropriation doctrine; or is tributary, in which case, the depletions from its withdrawal must be fully augmented if the depletions occur in an over-appropriated basin. The result in either case is that the produced water is available for consumption for other purposes, not just oil and gas operations. The water must not be encumbered by other needs and the operator must obtain a proper well permit from the NDWR before the water can be used for drilling and HF operations.

Reused or Recycled Drilling Water. Water that is used for drilling of one well may be recovered and reused in the construction of subsequent wells. The BLM encourages reuse and recycling of both the water used in well drilling and the water produced in conjunction with oil or gas production. However, as described above, the operator must obtain the right to use the water for this purpose.

On-Location Water Supply Wells. Operators may apply for, and receive, permission from the NDWR to drill and use a new water supply well. These wells are usually drilled on location to provide an on-demand supply. The proper construction, operation and maintenance, backflow prevention and security of these water supply wells are critical considerations at the time they are proposed to minimize impacts to the well and/or the waters in the well, water right holders and water-dependent resources. Plugging these wells is under the jurisdiction of the NDWR and BLM.

Authorization of any future proposed projects would require full compliance with local, state, and federal regulations and laws that relate to surface and groundwater protection and would be subject to routine inspections by the BLM and the State of Nevada Commission on Mineral Resources, Division of Minerals Memorandum of Understanding dated January 9, 2006, prior to approval.

III. Potential Impacts to Usable Water Zones

Impacts to freshwater supplies can originate from point sources, such as chemical spills, chemical storage tanks (aboveground and underground), industrial sites, landfills, household septic tanks, and mining activities. Impacts to usable waters may also occur through a variety of oil and gas operational sources which may include, but are not limited to, pipeline and well casing failure, and well (gas, oil and/or water) drilling and construction of related facilities. Similarly, improper construction and management of open fluids pits and production facilities could degrade ground water quality through leakage and leaching.

Should hydrocarbons or associated chemicals for oil and gas development, including HF, exceeding US Environmental Protection Agency (EPA)/NDEP standards for minimum concentration levels migrate into potable water supply wells, springs, or usable water systems, it could result in these water sources becoming non-potable and killing off aquatic species. Water wells developed for oil and gas drilling could also result in a drawdown in the quantity of water in nearby residential areas depending upon the geology and volumes of water extracted.

Usable groundwater aquifers are most susceptible to pollution where the aquifer is shallow (within 100 feet of the surface depending on surface geology) or perched, are very permeable, or connected directly to a surface water system, such as through floodplains and/or alluvial valleys or where operations occur in geologic zones which are highly fractured and/or lack a sealing formation between the production zone and the usable water zones. If an impact to usable waters were to occur, a greater number of people could be affected in densely populated areas versus sparsely populated areas characteristic of NV. Pollution could also impact usable waters in remote basins where interbasin transfer projects can pump and transport water through pipelines to urban areas, like Las Vegas and Reno. The BLM is also required to analyze potential impacts to aquatic species from groundwater contamination.

Potential impacts on usable groundwater resources from fluid mineral extraction activities could result from the following scenarios:

- i. Contamination of aquifers through the introduction of drilling and/or completion fluids through spills or drilling problems, such as lost circulation zones.
- ii. Communication of the induced hydraulic fractures with existing fractures potentially allows for HF fluid migration into usable water zones/supplies. The potential for this impact is likely dependent on the local hydraulic gradients where those fluids are dissolved in the water column.
- iii. Cross-contamination of aquifers/formations may result when fluids from a deeper aquifer/formation migrate into a shallower aquifer/formation due to improperly cemented well casings.
- iv. Localized depletion of perched aquifer or drawdown of unconfined groundwater aquifer.
Progressive contamination of deep confined, shallow confined, and unconfined aquifers if the deep confined aquifers are not completely cased off, and geologically isolated, from deeper oil bearing units. An example of this would be salt water intrusion resulting from sustained drawdown associated with the pumping of groundwater.

- v. Casing failure (casing ruptures in low pressure formations, casing corrosion)
- vi. Communication through old abandoned wells nearby
- vii. Transportation of fluids to and from site (accidents)
- viii. Wastewater disposal

The impacts above could occur as a result of the following processes:

Improper casing and cementing.

A well casing design that is not set at the proper depths or a cementing program that does not properly isolate necessary formations could allow oil, gas or HF fluids to contaminate other teaquifers/formations. In addition, old well casing and casing cement that has corroded over time can fail allowing contaminants to migrate into the well formation.

Natural fractures, faults, and abandoned wells.

If HF of oil and gas wells result in new fractures connecting with established natural fractures, faults, or improperly plugged dry or abandoned wells, a pathway for gas or contaminants to migrate underground may be created posing a risk to water quality. The potential for this impact is currently unknown but it is generally accepted that the potential decreases with increasing distance between the production zone and usable water zones. This potential again is dependent upon the site specific conditions at the well location.

Fracture growth.

A number of studies and publications report that the risk of induced fractures extending out of the target formation into an aquifer allowing hydrocarbons or other fluids to contaminate the aquifer may depend, in part, on the formation thickness separating the targeted fractured formation and the aquifer. According to a 2012 Bipartisan Policy Center report, the fracturing process itself is unlikely to directly affect freshwater aquifers because in Nevada fracturing typically takes place at a depth of 6,000 to 10,000 feet, while drinking water aquifers are typically less than 1,000 feet deep. However, some areas of Nevada, the deep carbonate aquifer can extend to 6,000 feet below ground surface. Recent studies have shown that induced fractures created during HF growing more than 350 meters vertically is less than 1% (Lacazette and Geiser). If a parcel is sold and development is proposed in usable water zones, those operations would have to comply with federal and/or state water quality standards or receive a Class II designation from the NDEP.

Fracture growth and the potential for upward fluid migration, through volcanic, sedimentary and other geologic formations depend on site-specific factors such as the following:

- i. Physical properties, types, thicknesses, and depths of the targeted formation as well as those of the overlying geologic formations.
 - ii. Presence of existing natural fracture systems and their orientation in the target formation and surrounding formations.
3. Amount and distribution of stress (i.e., in-situ stress), and the stress contrasts between the targeted formation and the surrounding formations.

Hydraulic fracture stimulation designs include the volume of fracturing fluid injected into the formation as well as the fluid injection rate and fluid viscosity; this information is evaluated against the above site specific considerations.

Fluid leak and recovery (flowback) of HF fluids.

Not all fracturing fluids injected into the formation during the HF process are recovered at the surface. Estimates of the fluids recovered range from 15-80% of the volume injected depending on the site (EPA 2010). Fluid movement into smaller fractures or other geologic substructures can be to a point where flowback efforts will not recover all the fluid or that the pressure reduction caused by pumping during subsequent production operations may not be sufficient to recover all the fluid that has leaked into the formation. Fracturing fluids can remain in the formation due to adsorption and chemical reactions, movement out of the capture zone, inadequate mixing, or from fracture collapse. It is noted that the fluid loss due to leakage into small fractures and pores is minimized by the use of cross-linked gels.

Willberg et al. (1998) analyzed HF flowback and described the effect of pumping rates on cleanup efficiency in initially dry, very low permeability (0.001 millidarcy) shale. Some wells in this study were pumped at low flowback rates (less than 3 barrels per minute (bbl/min)). Other wells were pumped more aggressively at greater than 3 bbl/min. Thirty-one percent of the injected HF fluids were recovered when low flowback rates were applied over a 5-day period. Forty-six percent of the fluids were recovered when aggressive flowback rates were applied in other wells over a 2-day period. In both cases, additional fluid recovery (10 percent to 13 percent) was achieved during the subsequent gas production phase, resulting in a total recovery rate of 41 percent to 59 percent of the initial volume of injected HF fluid. Ultimate recovery rate however, is dependent on the permeability of the rocks, fracture configuration, and the surface area of the fracture(s).

The ability of HF chemicals to migrate in an undissolved or dissolved phase into a usable water zone is likely dependent upon the location of the sealing formation (if any), the geology of the sealing formation, hydraulic gradients and production pressures.

HF fluids can remain in the subsurface unrecovered, due to “leak off” into connected fractures and the pores of rocks. Fracturing fluids injected into the primary hydraulically induced fracture can intersect and flow (leak off) into preexisting smaller natural fractures. Some of the fluids lost in this way may occur very close to the well bore after traveling minimal distances in the hydraulically induced fracture before being diverted into other fractures and pores. Once “mixed” with the native water, local and regional vertical and horizontal gradients may influence where and if these fluids will come in contact with usable water zones, assuming that there is inadequate recovery either through the initial flowback or over the productive life of the well. Faults, folds, joints, etc., could also alter localized flow patterns as discussed below.

The following processes can influence effective recovery of the fracture fluids:

Check-Valve Effect

A check-valve effect occurs when natural and/or newly created fractures open and HF fluid is forced into the fractures when fracturing pressures are high, but the fluids are subsequently prevented from flowing back toward the wellbore as the fractures close when the fracturing pressure is decreased (Warpinski et al., 1988; Palmer et al., 1991a).

A long fracture can be pinched-off at some distance from the wellbore. This reduces the effective fracture length. HF fluids trapped beyond the “pinch point” are unlikely to be recovered during flowback and oil/gas is unlikely to be recovered during production.

In most cases, when the fracturing pressure is reduced, the fracture closes in response to natural subsurface compressive stresses. Because the primary purpose of HF is to increase the effective permeability of the target formation and connect new or widened fractures to the wellbore, a closed fracture is of little use. Therefore, a component of HF is to “prop” the fracture open, so that the enhanced permeability from the pressure-induced fracturing persists even after fracturing pressure is terminated. To this end, operators use a system of fluids and “proppants” to create and preserve a high-permeability fracture-channel from the wellbore deep into the formation.

The check-valve effect takes place in locations beyond the zone where proppants have been placed (or in smaller secondary fractures that have not received any proppant). It is possible that some volume of stimulation fluid cannot be recovered due to its movement into zones that were not completely “propped” open.

Adsorption and Chemical Reactions

Adsorption and chemical reactions can also prevent HF fluids from being recovered. Adsorption is the process by which fluid constituents adhere to a solid surface and are thereby unavailable to flow with groundwater. Adsorption to coal is likely; however, adsorption to other geologic material (e.g., shale, sandstone) is likely to be minimal. Another possible reaction affecting the recovery of fracturing fluid constituents is the neutralization of acids (in the fracturing fluids) by carbonates in the subsurface.

Movement of Fluids outside the Capture Zone

Fracturing fluids injected into the target zone flow into fractures under very high pressure. The hydraulic gradients driving fluid flow away from the wellbore during injection are much greater than the hydraulic gradients pulling fluid flow back toward the wellbore during flowback and production (pumping) of the well. Some portion of the fracturing fluids could be forced along the hydraulically induced fracture to a point beyond the capture zone of the production well. The size of the capture zone will be affected by the regional groundwater gradients, and by the drawdown caused by producing the well. Site-specific geologic and hydrogeologic characteristics, injection pressure, and production pumping details should provide the information needed to estimate the dimension of the production well capture zone and the extent to which the fracturing fluids might disperse and dilute.

Incomplete Mixing of Fracturing Fluids with Water

Steidl (1993) documented the occurrence of a gelling agent that did not dissolve completely and actually formed clumps at 15 times the injected concentration in an induced fracture. Steidl also directly observed gel hanging in stringy clumps in many other induced fractures. As Willberg et al. (1997) noted, laboratory studies indicate that fingered flow of water past residual gel may impede fluid recovery. Therefore, some fracturing fluid gels appear not to flow with groundwater during production pumping and remain in the subsurface unrecovered. Such gels are unlikely to flow with groundwater during production, but may present a source of gel constituents to flowing groundwater during and after production.

IV. Geologic Hazards (including seismic/landslides)

Nevada is the 3rd most tectonically active state in the union. Since the 1850s there have been 63 earthquakes with a magnitude greater than 5.5, the cutoff for a destructive earthquake. Potential geologic hazards caused by HF include induced seismic activity in addition to the tectonic activity already occurring in the state. Induced seismic activity could indirectly cause a surficial landslide where soils/slopes are susceptible to failure. Landslides involve the mass movement of earth materials down slopes and can include debris flows, soil creep, and slumping of large blocks of material. Any destructive earthquake also has the potential to induce liquefaction in saturated soils.

Earthquakes occur when energy is released due to blocks of the earth’s crust moving along areas of weakness or faults. Earthquakes attributable to human activities are called “induced seismic events” or “induced earthquakes.” In the past several years induced seismic events related to energy development projects have drawn heightened public attention. Although only a very small fraction of injection and extraction activities at hundreds of thousands of energy development sites in the United States have induced seismicity at levels that are noticeable to the public, seismic events caused by or likely related to energy development have been measured and felt in Alabama, Arkansas, California, Colorado, Illinois, Louisiana, Mississippi, Nebraska, Nevada, New Mexico, Ohio, Oklahoma, and Texas.

A study conducted by the National Academy of Sciences (Induced Seismicity Potential in Energy Technologies, National Academy of Sciences, 2012) studied the issue of induced seismic activity from energy development. As a result of the study, they found that:

- The process of hydraulic fracturing a well as presently implemented for shale gas recovery does not pose a high risk for inducing felt seismic events; and

- Injection for disposal of waste water derived from energy technologies into the subsurface does pose some risk for induced seismicity, but very few events have been documented over the past several decades relative to the large number of disposal wells in operation.

However, a more recent study by the U.S. Geological Service has found that at some locations the increase in seismicity coincides with the injection of wastewater in deep disposal wells. Wastewater injection increases the underground pore pressure, which may, in effect, lubricate nearby faults thereby weakening them. If the pore pressure increases enough, the weakened fault will slip, releasing stored tectonic stress in the form of an earthquake. Even faults that have not moved in millions of years can be made to slip and cause an earthquake if conditions underground are appropriate (USGS 2014).

The potential for induced seismicity cannot be made at the leasing stage; as such, it will be evaluated at the APD stage should the parcel be sold/issued, and a development proposal submitted.

V. Spill Response and Reporting

Spill Prevention, Control, and Countermeasure (SPCC) Plans – EPA’s rules include requirements for oil spill prevention, preparedness, and response to prevent oil discharges to navigable waters and adjoining shorelines. The rule requires that operators of specific facilities prepare, amend, and implement SPCC Plans. The SPCC rule is part of the Oil Pollution Prevention regulation, which also includes the Facility Response Plan (FRP) rule. Originally published in 1973 under the authority of §311 of the Clean Water Act, the Oil Pollution Prevention regulation sets forth requirements for prevention of, preparedness for, and response to oil discharges at specific non-transportation-related facilities. To prevent oil from reaching navigable waters and adjoining shorelines, and to contain discharges of oil, the regulation requires the operator of these facilities to develop and implement SPCC Plans and establishes procedures, methods, and equipment requirements (Subparts A, B, and C). In 1990, the Oil Pollution Act amended the Clean Water Act to require some oil storage facilities to prepare FRPs. On July 1, 1994, EPA finalized the revisions that direct facility owners or operators to prepare and submit plans for responding to a worst-case discharge of oil.

In addition to EPA’s requirements, operators must provide a plan for managing waste materials, and for the safe containment of hazardous materials, per Onshore Order #1 with their APD proposal. All spills and/or undesirable events are managed in accordance with Notice to Lessee (NTL) 3-A for responding to all spills and/or undesirable events related to HF operations.

Certain oil and gas exploration and production wastes occurring at or near wellheads are exempt from the Clean Water Act, such as: drilling fluids, produced water, drill cuttings, well completion, and treatment and stimulations fluids. In general, the exempt status of exploration and production waste depends on how the material was used or generated as waste, not necessarily whether the material is hazardous or toxic.

VI. Public Health and Safety

The intensity, and likelihood, of potential impacts to public health and safety, and to the quality of usable water aquifers is directly related to proximity of the proposed action to domestic and/or community water supplies (wells, reservoirs, lakes, rivers, etc.) and/or agricultural developments. The potential impacts are also dependent on the extent of the production well’s capture zone and well integrity. Nevada’s Standard Lease Stipulations and Lease Notices specify that oil and gas development is generally restricted within 500 feet of riparian habitats and wetlands, perennial water sources (rivers, springs, water wells, etc.) and/or floodplains. Intensity of impact is likely dependent on the density of development.

VII. Hydraulic Frac Job Data for Nevada.

Operator	Noble Energy	Noble Energy	Noble Energy	Makoil	Grant Canyon
Well	Humboldt M2C-M2-21	Huntington K1L-1V	Humboldt M10C-M10-11	Portugese Mountain 14A	Blackburn #16
Total Base Water Volume (gal)	250,057	300,537	343,919	29,949	209,600
2% KCL Water	88.5614	0	86.45119	0	0
Fresh Water	0	88.9968	0	53.90215	85.2039
Water	1.57645	0.61826	0.81892	0.78169	0.53354
2-bromo-2-nitro-1, 3-propanediol	0.00202	0.00213	0.00358	0.00129	0.00171
Crystalline Silica, quartz	0.65036	8.59936	10.49356	32.39228	14.4277
Ethylene glycol monobutyl ether	0.02379	0.00537	0.01688	0.09718	0.02695
Isopropanol	0.00311	0.00351	0.00221	0.04926	0.00353
Methanol	0.00311	0.00353	0.00226	0.05782	0.00361

* Values are based on the percent of the total mass. These are the most common additives in all the jobs.

VIII. References

- BLM. (July 5, 2013). Bureau of Land Management Wyoming State Office: Hydraulic Fracturing White Paper.
- EPA June 2010. U.S. Environmental Protection Agency, Office of Research and Development, “Hydraulic Fracturing Research Study”. Website: <http://www.epa.gov/ogwdw000/uic/pdfs/hfresearchstudyfs.pdf>
- Lacazette, A., Geiser, P., Comment on Davies et al 2012 – Hydraulic Fractures: How far can they go?, *Marine and Petroleum Geology* (2013), doi: 10.1016/j.marpetgeo.2012.12.008.
- National Academy of Sciences. (June 2012). Induced Seismicity Potential in Energy Technologies--Report in Brief, by Committee on Induced Seismicity Potential in Energy Technologies.
- Nevada Division of Water Planning (NDWP). (March 1999). Nevada State Water Plan: Future Water Needs. P. ES-1. http://water.nv.gov/programs/planning/stateplan/documents/NV_State_Water_Plan-complete.pdf
- Paschke, Suzanne, Dr. (September 2011). Effects of Development on Groundwater Quality in the Denver Basin, Colorado.
- Steidl, P. (1993). Evaluation of induced fractures intercepted by mining, Proceedings 1993 Coalbed Methane Symposium, University of Alabama, pp.675-686.
- USGS 2014. U.S. Department of the Interior | U.S. Geological Survey. “Man Made Earthquakes”
URL: www.usgs.gov/blogs/features/usgs_top_story/man-made-earthquakes/.
- Warpinski, N.R., Branagan, P.T., Satler, A.R., Cippolla, C.L., Lorenz, J.G., and Thorne, B.J. 1988. A case study of a stimulation experiment in a fluvial, tight, sandstone gas reservoir. Society of Petroleum Engineers Paper No. 18258, Proceedings 63rd Annual Technology Conference, October 1988 (Houston), pp. 616-632.
- Willberg et al. (1997). Determination of the Effect of Formation Water on Fracture Fluid Cleanup Through Field Testing in the East Texas Cotton Valley.

Willberg DM, Steinsberger N, Hoover R, Card RJ, Queen J (1998) Optimization of fracture cleanup using flowback analysis. SPE 39920. Presented paper. SPE Rocky Mountain Regional/Low-permeability Reservoirs Symposium and Exhibition, Denver CO, 5-8 April 1998.

Appendix I -Analysis Tiered to and Incorporated by Reference

The following resources were determined to be present and maybe affected by the proposed action, but the analysis presented in the 2007 Ely Proposed RMP/FEIS (See Chapter 7 for reference) adequately discussed potential impacts relative to the June 2024 Oil and Gas Lease Sale because the Proposed Action is based on the RFFD. While the action of leasing does not authorize direct impacts to the following resources, there could be indirect and cumulative impacts associated with the Proposed Action. The tiered and incorporated analysis presented in this appendix serves as the discussion for assessing impacts to the following resources: Soil Resources, Vegetation, Forest/Woodland and other Plant Products, Noxious and Invasive Weed Management, Wild Horses, and Recreation.

The analysis for the No Action Alternative is common to all the following resources and is as follows: The No Action Alternative would have no additional impacts in the analysis area outside of those occurring under current management. Activities on currently leased parcels adjacent to the proposed parcels would remain on going as permitted on surrounding federal, state, and private lands.

Soil Resources

Affected Environment

The Ely Proposed RMP/FEIS describes the existing conditions, trends, and current management of soil resources within the Ely District Planning Area (pages 3.4-1 – 3.4-3). This EA tiers to and incorporates by reference the affected environment section for soil resources in the Ely Proposed RMP/FEIS. The analysis identifies four major settings of soils found in the Ely District, including basin floors, alluvial fans and stream terraces, fan piedmonts, and hills and mountains. The FEIS also includes a discussion of biological soil crusts found in the Great Basin and parts of the Mojave Desert. Section 3.4.2 of the FEIS discloses that soil resources in the Planning Area appear to be on a trend of increasing risk due to factors such as sparse to absent herbaceous vegetation, catastrophic fire, trampling by livestock, wild horses, or wildlife, and increasing recreational use and severe wildland fires affecting biological crusts. The Ely District estimates erosion rates prior to substantial ground disturbing activities in the Planning Area, and typically applies BMPs to minimize soil and erosion and sediment yield on the site-specific local level (Ely Proposed RMP/FEIS, Section 3.4.3, page 3.4-3).

Environmental Effects

The Ely Proposed RMP/FEIS describes the environmental consequences of geology and mineral extraction on soil resources within the Ely District Planning Area (pages 4.4-4 – 4.4-5). This EA tiers to and incorporates by reference the environmental consequences section discussing effects of geology and mineral extraction on soil resources in the Ely Proposed RMP/FEIS. The analysis identifies 17,100 acres of potential disturbance to soils from mineral extraction based on the RFFD. It also discloses that mineral extraction projects have the potential to result in soil compaction, erosion, excavation, and losses of soil quality in the project area. Additionally, vegetation removal for road and well pad construction could alter existing drainage patterns and accelerate gully and rill erosion. Effects can vary based on soil type, texture, moisture content, depth, and slope.

Though in general it is known what sorts of disturbance contribute to soil compaction, erosion, and losses of soil quality during oil and gas exploration and production activities (i.e., use of heavy equipment, removal of soil material, and mixing of soil horizons), impacts to soil from mineral extraction 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 COAs for each proposed activity.

Based on the “comparatively small extent” of reasonably foreseeable mineral exploration and extraction (less than 0.5 percent) in the Planning Area, and required implementation of COAs such as reclamation and BMPs (see Appendix E – Soil Resources) intended to offset effects, the effects of mineral extraction on soil resources are expected to be minimal (Ely Proposed RMP/FEIS, Section *Geology and Mineral Extraction*, pages 4.4-4 – 4.4-5).

Cumulative Effects

The Ely Proposed RMP/FEIS defines the cumulative effects area for soil resources as the Planning Area and a small portion of the Colorado River Basin that includes portions of the Muddy River and Virgin River drainages. This EA bases

impacts analysis on the RFFD analyzed for the Ely District RMP and therefore tiers to and incorporates by reference the cumulative impacts section for soil resources in the Ely Proposed RMP/FEIS (page 4.28-30 – 4.28-31). The analysis discloses that impacts on soils from producing commodities such as livestock, recreation, wild horses, and minerals would remain similar to or decrease from current condition and management while impacts on short and long-term soil erosion and sedimentation from vegetation treatments would increase.

When combining the direct and indirect impacts to soil resources from oil and gas exploration and development with past, present, and reasonably foreseeable future actions such as those described above, impacts would be minimal due to the scale of development presented in the RFFD (less than 0.5 percent of the Planning Area) and COAs and BMPs that would further reduce impacts to soils.

Vegetation

Affected Environment

The Ely Proposed RMP/FEIS describes the existing conditions, trends, and current management of vegetation resources including shrub lands, forests and woodlands, and riparian/wetland areas within the Ely District Planning Area (pages 3.5-1 – 3.5-13). This EA tiers to and incorporates by reference the affected environment section for vegetation resources in the Ely Proposed RMP/FEIS. The analysis identifies five Major Land Resource Areas delineated by the U.S. Department of Agriculture Natural Resources Conservation Service modified to reflect updated soils data, which include Major Land Resource Area 25, 28A, 28B, 29, and 30. A description of each Major Land Resource Area with associated major plant indicators, elevation/topography, climate, acres and percent of the planning area, associated watershed, and special notes is included as Table 3.5-1 in the Ely Proposed RMP/FEIS on pages 3.5-2 – 3.5-3. Major vegetation types in the Ely District include Pinyon-juniper, Aspen, High-elevation conifer, Salt desert shrub, Sagebrush, Mountain mahogany, Mojave Desert vegetation, Riparian/wetland, and Nonnative seedlings. These vegetation communities are products of the various natural and human-related disturbances and environmental factors occurring during the past 200 years, such as livestock grazing and reduced frequency of fire.

Environmental Effects

The Ely Proposed RMP/FEIS describes the environmental consequences of geology and mineral extraction on vegetation resources within the Ely District Planning Area (page 4.5-10). This EA tiers to and incorporates by reference the environmental consequences section discussing effects of geology and mineral extraction on vegetation resources in the Ely Proposed RMP/FEIS. The analysis identifies 17,100 acres that remain open to mineral extraction and anticipates no more than 17,100 non-contiguous acres of disturbance to vegetation from minerals development, which includes not only oil and gas extraction. Areas of soil compaction that result from mineral exploration, development, and production with heavy machinery could inhibit plant vigor and reclamation.

Though in general it is known what sorts of disturbance contribute to loss of vegetation vigor and reclamation success during oil and gas exploration and production activities (i.e., use of heavy equipment, removal of soil material, mixing of soil horizons, and removal of vegetation), impacts to vegetation from mineral extraction 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 COAs for each proposed activity.

Based on the 17,100 non-contiguous acres of reasonably foreseeable mineral exploration and extraction in the Planning Area, of which are largely associated with surface mining not oil and gas extraction, and required implementation of COAs such as reclamation and BMPs (see Appendix E – Vegetation Resources) intended to offset effects, the effects of mineral extraction on vegetation resources are expected to be minimal (Ely Proposed RMP/FEIS, page 4.5-10).

Cumulative Effects

The Ely Proposed RMP/FEIS defines the cumulative effects area for vegetation resources as the Planning Area. This EA bases impacts analysis on the RFFD analyzed for the Ely District RMP and therefore tiers to and incorporates by reference the cumulative impacts section for vegetation resources in the Ely Proposed RMP/FEIS (page 4.28-32 – 4.28-33). The analysis discloses that impacts to vegetation resources in the Planning Area have primarily included historic mining

activities and other human-caused surface disturbances, wildland fires and fire suppression, and historic grazing practices. Present impacts to vegetation resources include wildlife management, wild horse management, wildland fires, and watershed management. Additionally, other factors beyond Ely District management also have impacted vegetation resources, including drought, insects, wildland fire, and introduction of invasive species from disturbances on nearby private lands.

When combining the direct and indirect impacts to vegetation resources from oil and gas exploration and development with past, present, and reasonably foreseeable future actions such as those described above, impacts would be minimal due to the scale of development presented in the RFFD (less than 0.5 percent of the Planning Area) and COAs and BMPs that would further reduce impacts to vegetation resources.

Forest/Woodland and Other Plant Products

Affected Environment

The Ely Proposed RMP/FEIS describes the existing conditions, trends, and current management of forest and woodland products and other plant products within the Ely District Planning Area (pages 3.17-1 – 3.17-4). This EA tiers to and incorporates by reference the affected environment section for forest/woodland and other plant products in the Ely Proposed RMP/FEIS. The analysis describes typical uses of vegetation resources (i.e. cultural, social, and economic) in the Planning Area and woodland volumes in the Planning Area. It also discusses the collection of cacti and yucca in Nevada, which requires a permit according to Nevada State Law (NRS 527.060). Section 3.17.2 on page 3.17-2 of the Ely Proposed RMP/FEIS describes an increasing availability of pinyon and juniper for use as fuelwood and other products while the trend in usage of forest/woodland and other plant products remains static.

Environmental Effects

The Ely Proposed RMP/FEIS describes the environmental consequences of geology and mineral extraction on vegetation resources within the Ely District Planning Area (page 4.5-10). The Ely Proposed RMP/FEIS at page 4.7.-1 states “Forest/woodland and other plant products would be affected by activities that modify the quantity and quality of vegetation resources either directly or indirectly.” This EA tiers to and incorporates by reference the environmental consequences section discussing effects of geology and mineral extraction on vegetation resources in the Ely Proposed RMP/FEIS, since effects to forest/woodland and other plant products were included in the vegetation section. See Environmental Effects for Vegetation above.

Cumulative Effects

The Ely Proposed RMP/FEIS defines the cumulative effects area for forest/woodland and other plant products as pinyon-juniper woodlands throughout east-central Nevada. This EA bases impacts analysis on the RFFD analyzed for the Ely District RMP and therefore tiers to and incorporates by reference the cumulative impacts section for vegetation resources and forest/woodland and other plant products in the Ely Proposed RMP/FEIS (pages 4.28-32 – 4.28-33, pages 4.28-62 – 4.28-63). The analysis discloses that impacts to forest/woodland and other plant products have primarily included historic mining activities and other consumptive uses of fuelwood, various human-caused surface disturbances, wildland, and historic grazing practices. Surface disturbances, post early 1900s, and fire have affected a small percentage of the Planning Area, although fuelwood harvest occurred over vast areas during the mid to late 1800s and early 1900s. Current woodland conditions have been heavily influenced by aggressive fires suppression throughout the Planning Area. Climate fluctuations and the aforementioned past actions have contributed to the expansion of pinyon pine and juniper into areas once dominated by sagebrush. Present actions affecting vegetation composition and ecological health include livestock grazing, wild horse management, wildlife fire management, watershed management, spread and control of invasive species, and to a lesser degree in localized areas, harvest of forest/woodland and other plant products, geology and mineral extraction, rights-of-way, transportation, wildlife management, and recreation. Natural factors such as drought and wildland fire also affect production of forest/woodlands and other plant products.

When combining the direct and indirect impacts to vegetation resources from oil and gas exploration and development with past, present, and reasonably foreseeable future actions such as those described above, impacts would be minimal due to the scale of development presented in the RFFD (less than 0.5 percent of the Planning Area) and COAs and BMPs that would further reduce impacts to vegetation resources and forest/woodland and other plant products.

Noxious and Invasive Weed Management

Affected Environment

The Ely Proposed RMP/FEIS describes the existing conditions, trends, and current management of noxious and invasive weeds within the Ely District Planning Area (pages 3.21-1 – 3.21-5). This EA tiers to and incorporates by reference the affected environment section for noxious and invasive weed management in the Ely Proposed RMP/FEIS. Table 3.1-1 provides a list of noxious weeds designated by the State of Nevada that are known to occur in the Planning Area, which are common impediments to management objectives within the Great Basin as they cause economic and environmental hard or harm to human health. Additional species have been designated since the Record of Decision for the Ely District RMP, which can be found online on the [USDA NRCS Introduced, Invasive, and Noxious Plants List](#). Table 3.21-2 provides a list of invasive plant species known to occur in the Planning Area, which are of concern because of expanding distribution and adverse effects to native ecological systems. Species of highest concern include Russian knapweed, tall whitetop, tamarisk, dalmation toadflax, spotted knapweed, cheatgrass, halogeton, sahara mustard, yellow starthistle, and hoary cress. Several species of noxious and invasive weeds are expanding throughout the Planning Area, which has altered fire regimes, diminished forage for animals, and decreased productivity of the land. The Ely District adhered to the concept of integrated weed management and uses the most current species lists developed by the Nevada Department of Agriculture.

Environmental Effects

The Ely Proposed RMP/FEIS describes the environmental consequences of geology and mineral extraction on noxious and invasive weed management within the Ely District Planning Area (page 4.21-4). This EA tiers to and incorporates by reference the environmental consequences section discussing effects of geology and mineral extraction on noxious and invasive weed management in the Ely Proposed RMP/FEIS. The analysis discusses the introduction of noxious and invasive weeds as a function of vectors such as animals, winds, and vehicles that transport plant material to and within the planning area, and ground disturbances that promote their establishment (Ely Proposed RMP/FEIS, page 4.21-1). The analysis identifies 17,100 acres of potential disturbance from mineral extraction based on the RFFD, and states on pages 4.21-4 – 4.21-5, “Road construction, use, abandonment, and maintenance related to mineral development all provide the potential to transport and proliferate weeds.” There is moderate to low risk for the introduction and spread of noxious and invasive weeds due to current low levels of mineral development, assuming compliance with leases, permits, and BMPs contained within them.

Though in general it is known what sorts of disturbance contribute to noxious and invasive weed spread during oil and gas exploration and production activities (i.e., transport of seeds via wind, animals, and vehicles and ground disturbance from construction), impacts to vegetation from mineral extraction 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, a weeds risk assessment and area inventory or consultation of the district weeds database would occur and specific mitigation measures and BMPs would be attached as COAs for each proposed activity.

Based on the 17,100 acres of reasonably foreseeable mineral exploration and extraction in the Planning Area, of which are largely associated with surface mining not oil and gas extraction, and required implementation of COAs such as reclamation and BMPs (see Appendix E – Noxious and Invasive Weed Management) intended to offset effects, the effects of mineral extraction on noxious and invasive weed management are expected to be moderate to low (Ely Proposed RMP/FEIS, page 4.21-5).

Cumulative Effects

The Ely Proposed RMP/FEIS defines the cumulative effects area for noxious and invasive weed management as the Planning Area and surrounding areas that could be the source of weed seeds. This EA bases impacts analysis on the RFFD analyzed for the Ely District RMP and therefore tiers to and incorporates by reference the cumulative impacts section for noxious and invasive weed management in the Ely Proposed RMP/FEIS (pages 4.28-70 – 4.28-71). Past actions that have affected noxious and invasive weed management include historic mining activities, road construction, vehicle traffic, local agriculture, other human-caused surface disturbances, wildland fires, historic grazing practices, and drought. Present

actions include agriculture, livestock grazing, wild horse management, mineral development and other construction activities, drought, wildland fires, insect infestations, vegetation and watershed treatments, land disposal actions, recreation, highway traffic, and off-highway vehicle use.

When combining the direct and indirect impacts to noxious and invasive weed management from oil and gas exploration and development with past, present, and reasonably foreseeable future actions such as those described above, impacts would be minimal due to the scale of development presented in the RFFD (less than 0.5 percent of the Planning Area) and COAs and BMPs that would further reduce impacts to noxious and invasive weed management.

Recreation

Affected Environment

The Ely Proposed RMP/FEIS describes the existing conditions, trends, and current management of recreation resources within the Ely District Planning Area (pages 3.15-1 – 3.15-3). This EA tiers to and incorporates by reference the affected environment section for recreation resources in the Ely Proposed RMP/FEIS. Recreation in the planning area typically consists of casual and dispersed uses including off-highway vehicle use, hunting, fishing, camping, cross-country skiing, horseback riding, caving, geocaching, rock climbing, mountain biking, and cultural tourism. The analysis recognizes that recreation visits to the Ely District have been increasing largely due to local (Lincoln and White Pine Counties) and regional (Clark County and western Utah) population growth. Activities such as rock climbing, bouldering, mountain biking, and caving are increasing in popularity throughout the western U.S., including within the Ely District. Off-highway vehicle use has also been increasing within the Ely District.

Recreation is managed in the planning area through the designation of special recreation management areas and extensive recreation management areas (Ely Proposed RMP/FEIS, Section 3.15.3 at 3.15-1). The goal of special recreation management areas is to provide specific recreation activity and experience opportunities, while extensive recreation management areas usually include primitive recreation sites and minimal facilities. There are three extensive recreation management areas within the Ely District consisting of 4.24, 3.82, and 3.5-million acres each. Visitors to these recreation management areas are expected to be self-reliant when participating in recreational activities. The Ely District also manages for competitive recreation events, commercial enterprises, and other organized events through the use of Special Recreation Permits (SRPs). The majority of SRPs are issued for outfitting and guiding activities, and for off-highway vehicle events (Ely Proposed RMP/FEIS, Section 3.15.3 at page 3.15-3).

Environmental Effects

The Ely Proposed RMP/FEIS describes the environmental consequences of geology and mineral extraction on recreation within the Ely District Planning Area (page 4.15-4). This EA tiers to and incorporates by reference the environmental consequences section discussing effects of geology and mineral extraction on recreation resources in the Ely Proposed RMP/FEIS. The analysis identifies 17,100 acres of potential disturbance from mineral extraction based on the RFFD with “a minimal chance for interaction with recreation activities” (page 4.15-4).

Though in general it is known what sorts of disturbance interact with recreation quality during oil and gas exploration and production activities (i.e., impeded visual quality from development, impeded access and/or additional access to historically inaccessible sites), impacts to recreation from mineral extraction 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 (see Appendix E – Travel Management and Off-Highway Vehicle Use and Recreation) would be attached as COAs for each proposed activity.

Cumulative Effects

The Ely Proposed RMP/FEIS defines the cumulative effects area for recreation resources as the Planning Area and a population centers outside the planning area within a reasonable driving distance for recreational activities (e.g., Clark County). This EA bases impacts analysis on the RFFD analyzed for the Ely District RMP and therefore tiers to and incorporates by reference the cumulative impacts section for recreation in the Ely Proposed RMP/FEIS (pages 4.28-58 – 4.28-59). The analysis discloses that the primary factor involved for impacts to recreation is the quantity of land available

for recreational activities, and the quality of recreational opportunities available upon that land. However, many activities have a mixed impact on recreation as a whole, and as one type of recreational opportunity is lost another might form.

When combining the direct and indirect impacts to recreation resources from oil and gas exploration and development with past, present, and reasonably foreseeable future actions such as those described above, impacts would be minimal due to the scale of development presented in the RFFD (less than 0.5 percent of the Planning Area) and COAs and BMPs that would further reduce impacts to recreation.

Wild Horses

Affected Environment

The Ely Proposed RMP/FEIS describes the existing conditions, trends, and current management of Wild Horses within the Ely District Planning Area (pages 3.8-1 – 3.8-7). The Ely District RMP (2008) designated six Herd Management Areas (HMA) covering 3.7 million acres. After the passage of the Wild Free-Roaming Horse and Burro Act in 1971, a comprehensive inventory was conducted in the planning area. It was determined that some herds exceeded a level that could be supported on a long-term basis by the available forage and water. To control the number of wild horses, gather operations are sporadically held within the HMAs. Gathers help to maintain appropriate management levels and achieve a thriving natural ecological balance while maintaining a multiple use relationship, as well as achieving rangeland health standards.

Environmental Effects

The Ely Proposed RMP/FEIS describes the environmental consequences of geology and mineral extraction on wild horses within the Ely District Planning Area (pages 4.8-6 – 4.8-7). This EA tiers to and incorporates by reference the affected environment section for wild horses in the Ely Proposed RMP/FEIS. Potential short-term impacts to wild horses from geology and mineral extraction include vegetation loss, habitat fragmentation, herd displacement, and increased noise and human presence. Potential long-term impacts include irretrievable loss of habitat, change in vegetation composition, and continuing habitat fragmentation.

Though in general it is known what sorts of disturbance contribute to impacts to wild horses during oil and gas exploration and production activities (i.e., increased human and motorized activity that leads to displacement and installation of fences that disrupts free roaming wild horse movement), impacts to wild horses from mineral extraction 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 (see Appendix E – Wild Horses) would be attached as COAs for each proposed activity.

Cumulative Effects

The Ely Proposed RMP/FEIS defines the cumulative effects area for wild horses is the array of existing herd management areas, a buffer around these areas that horses occasionally use and a few herd management areas that abut the planning area boundary with the associated horse herd commonly cross to adjoining areas outside the planning area. This EA bases impacts analysis on the RFFD analyzed for the Ely District RMP and therefore tiers to and incorporates by reference the cumulative impacts section for wild horses in the Ely Proposed RMP/FEIS (page 4.28-44-4.28-45). The analysis discloses that impacts to wild horses related to the proposed RMP would generally improve habitat for wild horse herds on a long-term basis, while many of the potential impacts associated with interrelated projects would reduce habitat, but typically to a lesser degree. The overall cumulative effect would be general improvement in the habitat for long term herd health and viability.

When combining the direct and indirect impacts to wild horses from oil and gas exploration and development with past, present, and reasonably foreseeable future actions such as those described above, impacts would be minimal due to the scale of development presented in the RFFD (less than 0.5 percent of the Planning Area) and COAs and BMPs that would further reduce impacts to wild horses.

Appendix J-Leasing Preference Ratings for Nominated Lease Parcels

Leasing Preference Rating Based on the Following Criteria								
Parcel Information		Preference Criteria					Preference for Leasing	
Office	Parcel	1 Proximity to Existing Development	2 Habitat	3 Cultural Resources	4 Recreation/Other Resources	5 Potential (O&G))	High	Low
CFO	NV-2024-06-2007	Low	High	High	High	Low		X