

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

Environmental Assessment

for the

2022 First Quarter Competitive Oil and Gas Lease Sale

DOI-BLM-NV-B000-2021-0007-Other

October 2021

PREPARING OFFICE

U.S. Department of the Interior
Bureau of Land Management
Battle Mountain District, Nevada



Table of Contents

Acronyms & Definitions	iii
Chapter 1. Introduction.....	1
1.1 Background	1
1.2 Project Location	2
1.3 Purpose and Need for Action	5
1.4 Decision to be Made	5
1.5 Land Use Plan Conformance	5
1.6 Relationship to Statutes, Regulations and Policy.....	5
1.7 Scoping and Public Involvement	7
Chapter 2. Proposed Action and Alternatives	9
2.1 Alternative A –Proposed Action	9
2.2 Alternative B –Removing parcels that overlap the Wildlife Management Area	9
2.3 Alternative C –No Action or No Leasing	12
Chapter 3. Affected Environment and Environmental Consequences.....	12
3.1 Analysis Process Overview.....	12
3.1.1 Methods and Assumptions	12
3.1.2 Affected Area and Degree of Effects	13
3.1.3 Time Period Considered.....	13
3.1.4 Analysis Area.....	13
3.1.5 Other Terms Used	13
3.1.6 Supplemental Authorities and Other Resources Considered	13
3.1.7 Environmental Consequences of Alternative C – No Leasing (All Resources).....	15
3.2 Environmental Effects of Alternative A or Alternative B.....	16
3.2.1 Air Quality	16
3.2.2 Greenhouse Gas (GHG) and Climate Change.....	20
3.2.3 Soils.....	31
3.2.4 Water.....	32
3.2.5 Vegetation and Special Status Plant Species	36
3.2.6 Noxious Weeds and Invasive, Non-Native Species	37
3.2.7 Wildlife Resources	39
3.2.8 Grazing Management.....	42
3.2.9 Cultural Resources	43

3.2.10	Native American Cultural and Religious Concerns	44
3.2.11	Recreation	46
3.2.12	Visual Resources.....	46
3.2.13	Geology and Mineral Resources	48
3.2.14	Land Use Authorizations	50
3.2.15	Socioeconomic Values and Environmental Justice.....	51
3.2.16	Waste, Hazardous and Solid	54
Chapter 4.	List of Preparers.....	56
Chapter 5.	References.....	57

List of Tables

Table 1.	Supplemental authorities considered in the EA.	14
Table 2.	Other resources considered in the EA.....	15
Table 3.	Alternative Action Table.....	16
Table 4.	Air Quality Index Data 2016-2020	17
Table 5.	Estimated maximum year and average year Criteria and Hazardous Air Pollutants.	20
Table 6.	Global and U.S. GHG Emissions 2015 - 2019 (Mt CO ₂ /yr).....	21
Table 7.	State GHG Emissions	22
Table 8.	Estimated Life of Lease Emissions (On-Site) from Well Development and Production Operations (Metric tonnes)	23
Table 9.	Estimated Life of Lease Indirect Emissions from the End-Use Combustion of Produced Oil and Gas (Metric tonnes and Mt)	23
Table 10.	Estimated Direct and Indirect Emissions from the Lease Parcels on an Annual and Life of Lease basis (Metric tonnes and Mt)	23
Table 11.	Comparison of Lease Sale Annual Emissions to Other Sources (Mt)	24
Table 12.	Comparison of the Life of Lease Emissions to other Federal Oil and Gas Emissions from Existing Wells, Development of Approved APDs, and Other Leasing Actions in the State and Nation. ..	25
Table 13.	SC-GHGs Associated with Future Potential Development	28
Table 14.	Reasonably Foreseeable Projected Emissions	29
Table 15.	Grazing allotments with proposed lease parcels for February 2022 lease sale.....	42
Table 16.	Table of Authorized Leases that overlap the WMA boundary	50
Table 17.	Population density by county.....	51
Table 18.	Population density for census tracts.....	51
Table 19.	List of specialists	56

Acronyms & Definitions

ACEC	Area of Critical Environmental Concern
AFY	acre-feet (AF) or acre-feet per year
APD	Application for Permit to Drill
AQI	Air Quality Index
AQRV	Air Quality Related Values
AR	Assessment Report
ARMPA	Approved Resource Management Plan Amendment
AUM	Animal Unit Month
BAPC	Bureau of Air Pollution Control
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BMD	Battle Mountain District
BMPs	Best Management Practices
CAA	Clean Air Act
CAP	Criteria Air Pollutants
CESA	Cumulative Effects Study Area
CFR	Code of Federal Regulations
COAs	Conditions of Approval
CSU	Controlled Surface Use
DOE	Department of Energy
DOI	United States Department of the Interior
EA	Environmental Assessment
EIA	Energy Information Administration
EIS	Environmental Impact Statement
EJ	Environmental Justice
EO	Executive Order
EOI	Expression of Interest
ESA	Endangered Species Act
EPA	Environmental Protection Agency
EUR	Estimated Ultimate Recovery
FLPMA	Federal Land Policy and Management Act of 1976
FONSI	Finding of No Significant Impact
FOOGLRA	Federal Onshore Oil and Gas Leasing Reform Act
FR	Federal Register
FRP	Facility Response Plan
GBNP	Great Basin National Park
GHG	Greenhouse gas
GHGRP	Greenhouse Gas Reporting Program
GHMA	General Habitat Management Area
GIS	Geographic Information System
GRSG	Greater Sage-Grouse

GWP	Global Warming Potential
HAP	Hazardous Air Pollutants
HF	Hydraulic Fracturing
HMA	Herd Management Area
ID Team	interdisciplinary team
IM	Instruction Memorandum
IPCC	International Panel Climate Change
LN	Lease Notice
LUP	Land Use Plan
MBTA	Migratory Bird Treaty Act
MD	Management Decision
MLA	Mineral Leasing Act
MLFO	Mount Lewis Field Office
MOU	Memorandum of Understanding
MR	Mineral Resources
MT	Megatonne
NAAQS	National Ambient Air Quality Standards
NAC	Nevada Administrative Code
NCLS	Notice of Competitive Lease Sale
NDA	Nevada Department of Agriculture
NDEP	Nevada Division of Environmental Protection
NDOM	Nevada Division of Minerals
NDOW	Nevada Department of Wildlife
NDWR	Nevada Division of Water Resources
NDWQ	Nevada Division of Water Quality
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NNHP	Nevada Natural Heritage Program
NOAA	National Oceanic and Atmospheric Administration
NSO	Nevada State Office
NSO	No Surface Occupancy
OG	Oil and gas
OHMA	Other Habitat Management Area
ONRR	Office of Natural Resources Revenue
PHMA	Priority Habitat Management Area
PL	Public Law
PLO	Public Land Order
PRMP	Proposed Resource Management Plan
RFD	Reasonably Foreseeable Development
RFFD	Reasonably Foreseeable Future Development
RMP	Resource Management Plan
ROD	Record of Decision
ROW	Right-of-Way
SETT	Sagebrush Ecosystem Technical Team
SFA	Sagebrush Focal Area

SHPO	Nevada State Historical Preservation Office
SI	Supplemental Information
SOP	Standard Operating Procedures
SRMA	Special Recreation Management Area
SSS	Special Status Species
TFO	Tonopah Field Office
TL	Timing Limitation
U.S.	United States
USC	United States Constitution
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGCRP	United States Climate Research Panel
USGS	United States Geological Survey
VOC	Volatile Organic Compound
VRI	Visual Resource Inventory
VRM	Visual Resource Management
WMA	Wildlife Management Area
WO	Washington Office
WSA	Wilderness Study Area

Chapter 1. Introduction

1.1 Background

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

During the land use planning process required by the FLPMA¹, the BLM analyzes several alternatives before deciding which public lands and minerals are open for leasing and under what terms and conditions. In accordance with the Land Use Plan (LUP), lands can be deemed open to leasing under standard terms and conditions, closed to leasing, or open under special operating constraints—including No Surface Occupancy (NSO)—identified as lease stipulations at the lease stage. Lease stipulations (43 Code of Federal Regulations [CFR] 3101.1-2) 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 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 February 28, 2022.

If the parcel is not purchased at the lease sale through the competitive bidding process, it may still be leased non-competitively within two years after the initial offering at the minimum bid cost. Parcels obtained non-competitively may be re-parceled by combining or deleting other previously offered lands. Mineral estate that is not leased within a two-year period after an initial offering will no longer be available and must go through another separate competitive lease sale process prior to being leased. 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.

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.

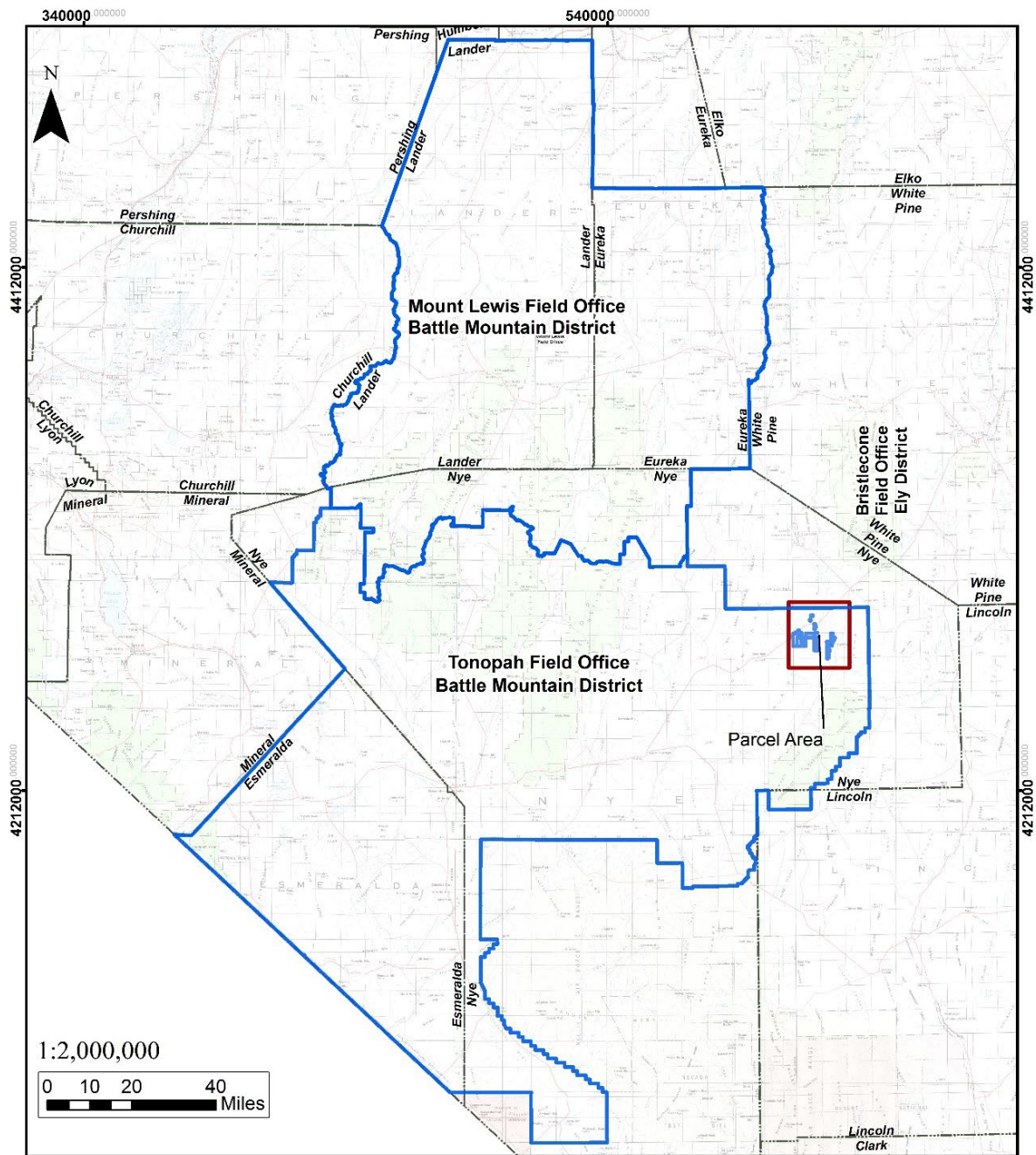
1.2 Project Location

The Bureau of Land Management (BLM) Battle Mountain District (BMD) office encompasses about 13.5 million acres, of which approximately 10.4 million acres are public lands managed by the BLM. The February 2022 preliminary parcel list (*SI Section 1*) contains 10 parcels covering 10,496.59 acres in Tonopah Field Office area of the BMD (Figures 1-2). The lease parcels are located in Railroad Valley, northern Nye County, Nevada.

The lease parcels are a subset of parcels that were initially nominated and analyzed by BMD for the December 2020 competitive oil and gas lease sale. The analysis was documented in an EA, DOI-BLM-NV-B000-2020-0012-EA which consisted of 14 parcels totaling 16,598.88 acres. The EA was posted for public comments from July to August 2020. A total of three parcels were removed from the sale due to a pending withdrawal and two parcels were reduced in size. The FONSI was signed on September 24, 2020, by the District Manager and the final 11 parcels and approximately 10,673 acres were available for the sale; however, the lease sale was postponed and later did not take place.

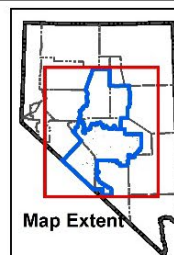
² The NEPA Register is a BLM environmental information internet site and can be accessed online at: <https://eplanning.blm.gov/eplanning-ui/home>.

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



2022 Battle Mountain District Oil & Gas Lease Sale

- 2022_O&G Parcels
- ParcelArea



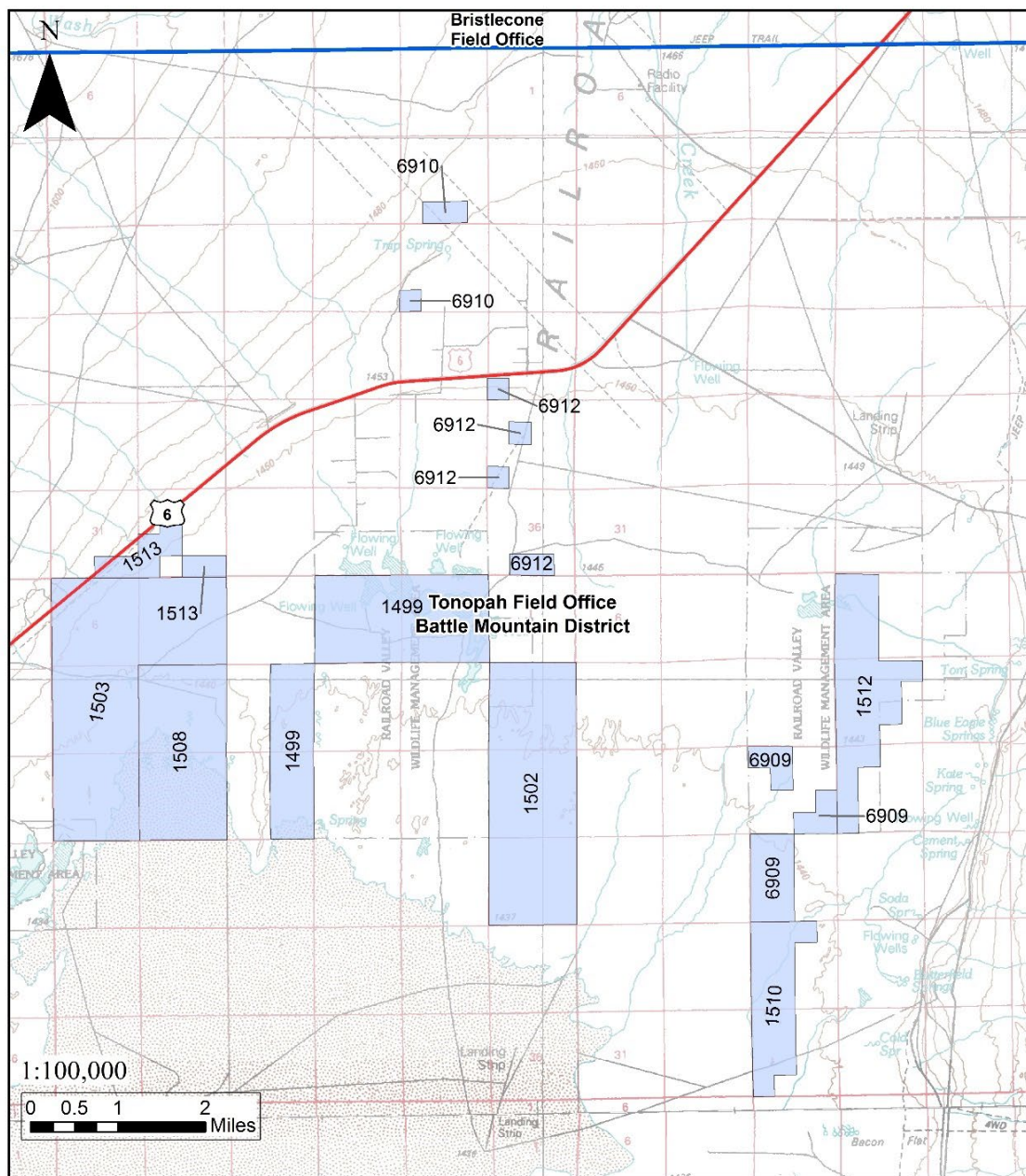
United States Department Of The Interior

Bureau of Land Management
Tonopah Field Office
1553 S. Main Street/P.O. Box 911
Tonopah, NV 89049





No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.

Figure 1. Oil and Gas Lease Sale proposed parcels overview, Battle Mountain District.



2022 Battle Mountain District Oil & Gas Lease Sale

 2022_O&G Parcels
 US Highway



United States Department Of The Interior

Bureau of Land Management
 Tonopah Field Office
 1553 S. Main Street/P.O. Box 911
 Tonopah, NV 89049



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.

Figure 2. February 2022 Oil and gas proposed lease sale parcels Tonopah Field Office.

1.3 Purpose and Need for Action

The purpose of this action is for the BMD to consider offering for leasing oil and gas parcels that the preliminary reviews have indicated are suitable for oil and gas development. 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 Tonopah RMP, and the associated Records of Decision, and all subsequent applicable amendments. The RMP addresses land use goals and objectives, allowable uses, and management actions for the field office.

Tonopah RMP (Tonopah Field Office), approved 1997

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

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

1.6 Relationship to Statutes, Regulations and Policy

The Proposed Action and alternatives are in conformance with the NEPA of 1969 (P.L. 91-190 as amended; 42 U.S.C. §4321 et seq.); the MLA of 1920 as amended and supplemented (30 U.S.C. 181 et seq.); the FOOGLRA of 1987, with regulatory authority under 43 CFR Part 3100, Onshore Oil and Gas Operations (43 CFR Part 3160); 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 (EO) 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 SI Section 11.

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.

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.

1.7 Scoping and Public Involvement

The lease parcels are a subset of parcels that were initially nominated, analyzed, and commented on in 2020, as stated in Section 1.1 above.

External scoping: In preparation for the lease sale, BLM released the current parcel list and map to the public for scoping comments from August 31st to October 1st, 2021. The BLM received 23,176 scoping comments on the lease sale, a summary of comments is provided in *Supplemental Information (SI)* Section 14. Scoping comments were similar-themed and include topics such as climate change, delaying or halting leasing, leasing reform, updating resource management plans, protection for critical habitats, social justice, human health and safety, and water resource protection. This list is not all inclusive. Many of the comments refer to the combined, multi-state, oil and gas lease sale.

Internal scoping: In preparing the preliminary EA that would be released for public comment, the BMD ID Team conducted internal scoping, identified potential resource conflicts, and consulted the original EA and public comments received in 2020.

Native American Coordination: In 2020, the BMD initiated coordination regarding the proposed lease parcels with the Ely Shoshone and Duckwater Shoshone Tribes by letter July 7, 2020. On September 2, 2021, BMD re-initiated coordination with Timbisha Shoshone, Yomba Shoshone, Ely Shoshone, and Duckwater Shoshone Tribes. Coordination with the Tribes is always ongoing. If any lease parcel is later found to contain resources protected under the NHPA, American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, Executive Order 13007, or other statutes and executive orders, BLM will not approve ground-disturbing activities that may affect such resources until completing its tribal consultation obligations; and may require modification to exploration or development proposals or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized, or mitigated.

Nevada Department of Wildlife and U.S. Fish and Wildlife Service input: Concurrently with initial internal scoping, BMD provided the proposed lease sale parcel locations to Nevada Department of Wildlife (NDOW) and U.S. Fish and Wildlife Service (USFWS). Both agencies were available for a coordination meeting with the Nevada State Office regarding preliminary concerns. In the more recent public scoping period, NDOW expressed concerns for the Railroad Valley Springfish, the Lockes pyrg, the Railroad Valley Tui Chub, and the Western Toad, along with oil and gas leasing within the Railroad Valley Wildlife Management Area. NDOW has asked that the RMP be reviewed as needed to aid in management of the Railroad Valley Wildlife Management Area.

Public comment periods and EA revisions: BLM received [reserved] public comments on the lease sale (*SI* Section 15).

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 *Stipulations*, with the parcels to which each stipulation would apply.

2.1 Alternative A –Proposed Action

The BLM would offer for lease all or part of the nominated parcels (covering approximately 10,497 acres) in the lease sale. The leases would include the standard lease terms and conditions for development of the surface of oil and gas leases provided in 43 CFR 3100 (BLM Form 3100-11) along with all stipulations mandated by policy (such as the Competitive Leasing Handbook, H-3120-1) and by the governing LUP.

Legal land descriptions along with corresponding stipulations as well as notices added to address resource issues found through review and analysis that would be attached to each parcel are located within the *Stipulations* document. 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 Development (RFD) Scenario is assumed wherein all 10 nominated parcels will be developed.

2.2 Alternative B –Removing parcels that overlap the Wildlife Management Area

Alternative B removes parcels overlapping the Railroad Valley Wildlife Management Area (WMA). Under this alternative, parcels 1499, 1502, 1503, 1512, and 6909 would not be offered. Parcels 1503, 1508, 1510, 6910, and 6912 would be offered, totaling 2,560 acres. Railroad Valley is one of the “few sizeable riparian areas in Nevada” (BLM, 1994). A 1968 Public Land Order reduced the size of the area to 14,720 acres. To preserve and enhance areas for special status species, the Tonopah Field Office

Proposed RMP and Final EIS, proposed to designate a 15,470-acre Area of Critical Environmental Concern (ACEC) to include Lockes Ponds, Big Well Ponds, Blue Eagle Ponds, Chimney Springs, and the Trap Springs-Gravel Bar areas. To manage the area, the PRMP proposed to establish a Special Recreation Management Area (SRMA) to limit vehicle use to existing road and trails in the ACEC; however, it would allow fluid mineral leasing with NSO on 3,480 acres and reduce the withdrawal to mineral entry from 14,710 acres to 3,040 acres and withdraw 440 acres of riparian area at Lockes Pond.

In the Approved RMP (BLM, 1997), the ACEC was never established nor was the SRMA. A total of 3,480 acres of the WMA are open to fluid mineral leasing with NSO and the remaining area inside the WMA is CSU, limited access to existing roads and trails (Figure 3) to “encourage safe, public access and recreational use of public lands while ensuring protection of important resource values.” (BLM, 1997)

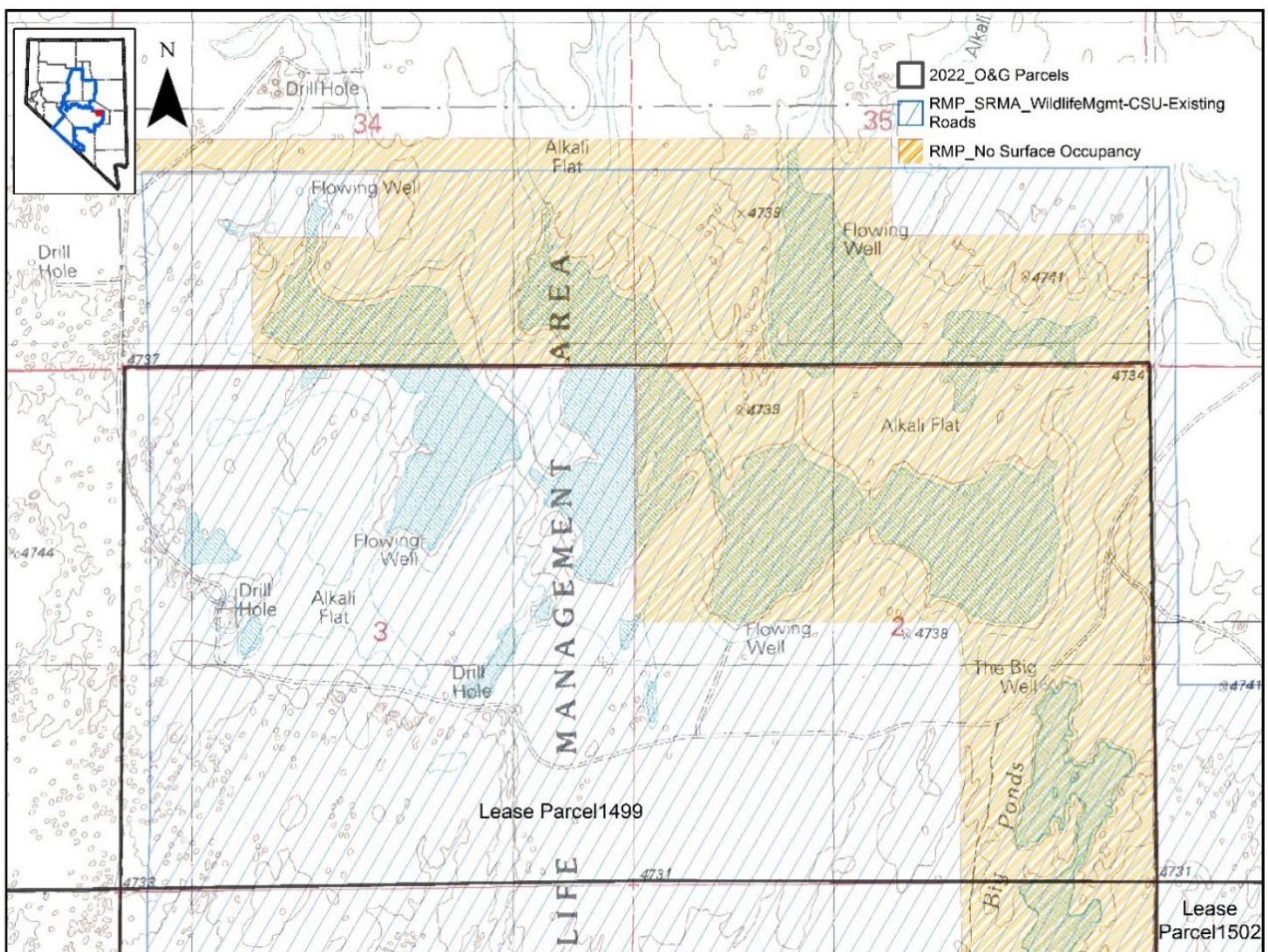
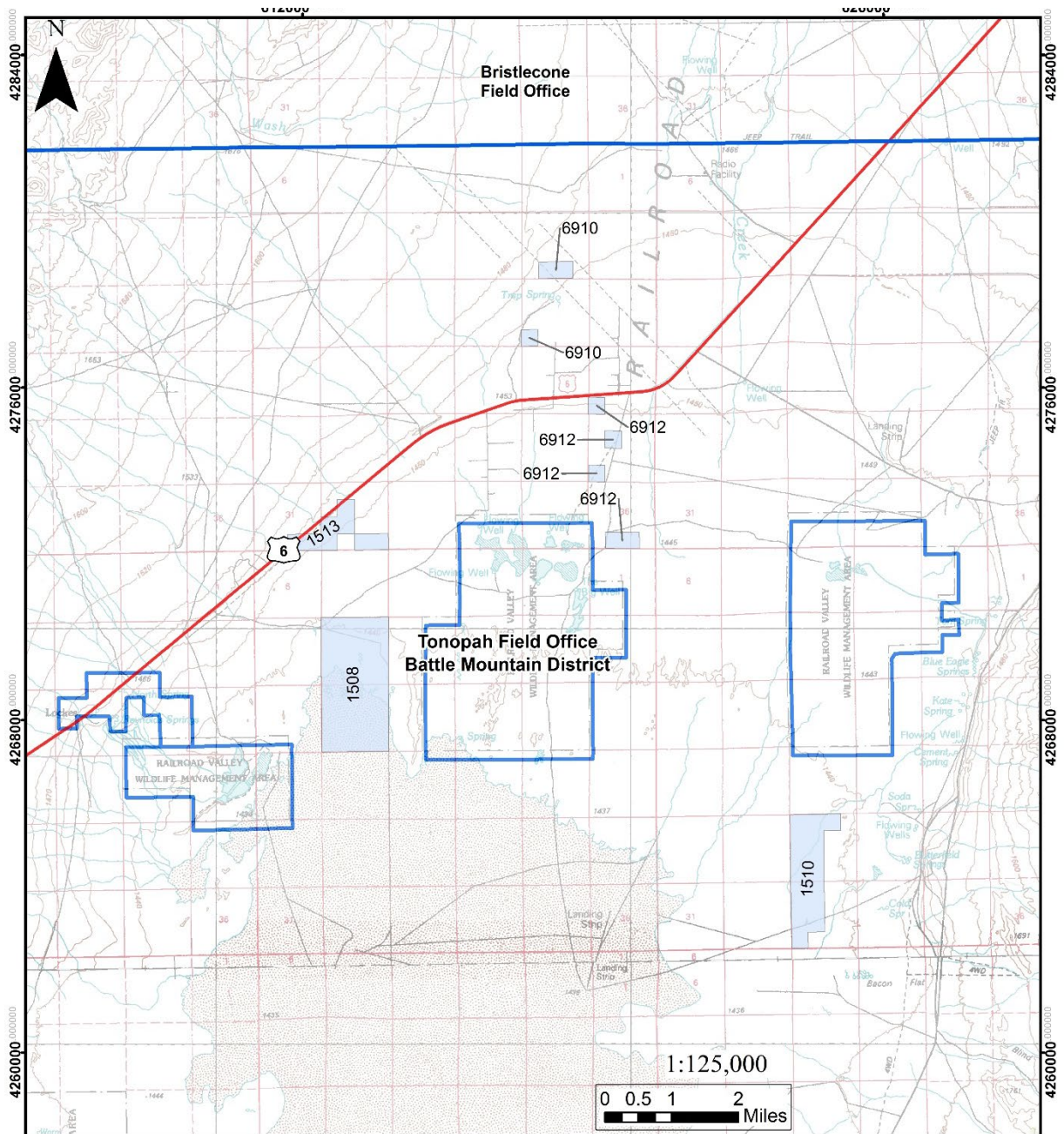


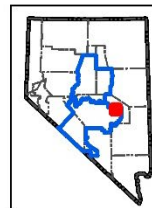
Figure 3. Example of RMP constraints for WMA and Oil and Gas Leasing

Removing the parcels that overlap the Lockes Ponds, the Big Well, and Blue Eagle portions of the WMA would reduce the lands available for oil and gas leasing to five (5) parcels with the corresponding 2,560 acres (Figure 4).



2022 Battle Mountain District Oil & Gas Lease Sale

- 2022_O&G Parcels_Alternative B
- US Highway
- RMP_SRMA_WildlifeMgmt_Travel on Existing Roads



United States Department Of The Interior

Bureau of Land Management
Tonopah Field Office
1553 S. Main Street/P.O. Box 911
Tonopah, NV 89049



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed through digital means and may be updated without notification.

Figure 4. Alternative B - 2022 Oil and gas proposed lease sale parcels relative to the Wildlife Management Area.

The removal of parcel lands from the WMA would not prevent existing leases from being developed but would prevent new lands from being leased in this lease sale. Any new oil and gas development would be subject to additional NEPA analysis if proposed within the WMA.

2.3 Alternative C –No Action or No Leasing

In accordance with BLM NEPA guidelines H-1790-1, Chapter 6, this EA evaluates a No Leasing Alternative. Alternative C forms a baseline for assessing and comparing the potential impacts of the other alternatives. Under this alternative, no parcels in the Battle Mountain District would be offered for lease in February 2022. 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.

Chapter 3. Affected Environment and Environmental Consequences

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 Oil and Gas Assumptions (see SI Section 8) and the RFD scenario for the BMD (SI Section 9). 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 Table 1 or Table 2, 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.

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

The surface disturbance estimate used to analyze the alternatives in this EA is based on the RFD scenario in SI Section 9 which comes from the combined Tonopah RMP and Shoshone RMP for the BMD. Based on historic information and anticipated activity, approximately 25 wells could be drilled and 65-100 acres of surface disturbance associated with potential oil and gas exploration and production activities could be expected to occur in the BMD over the next ten years. These figures for number of wells and disturbance are irrespective of the number of parcels or acreage being offered, and thus apply to Alternative A and Alternative B.

Types of activities that could occur are assumed to be those associated with technologies currently in use in geologically similar areas, as described in SI Section 8 and would be limited by the stipulations applied (see *Stipulations*).

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 sale 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 affected area and degree of effects (occurring at a later time). This chapter addresses those in 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, 2022 to 2032. This represents the initial term for an oil and gas lease, which expires at that time if it has not been developed. 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 Battle Mountain District in which the lease parcels occur. It includes Railroad Valley, Nye County Nevada in the Tonopah Field Office area, where the lease parcels are located (Figures 1-2). Under Alternative A – Proposed Action, the Analysis Area includes all lease parcels. Under Alternative B – Removing Parcels that overlap the Wildlife Management Area, the Analysis Area includes the reduced parcel area as shown in Figures 3 and 4.

3.1.5 Other Terms Used

The term “mitigation” as used in this document refers to resource protection measures that could be included in a specific proposal and implemented when leases are developed. The terms “effects,” “impacts,” and “consequences” are synonyms and may be used interchangeably. Definitions of other terms, abbreviations and acronyms used in this document are found in Acronyms & Definitions at the beginning of this document.

3.1.6 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 1 outlines these elements. Other resources considered are shown in Table 2. Resources not present or not affected are not addressed further.

Table 1. Supplemental authorities considered in the EA.

Supplemental Authority Element	Not Present	Present/Not Affected	Present/May be Affected	Rationale
Air quality, climate change and greenhouse gases			√	See Sections 3.2.1 and 3.2.2
Areas of Critical Environmental Concern	√			The proposed lease parcels are not located in or near any established Area of Critical Environmental Concern.
Cultural resources			√	See Section 3.2.9
Environmental justice		√		An American Indian population is present and is not expected to be disproportionately affected. See SI Section 11.
Farmlands, prime or unique	√			There are no Prime or Unique Farmlands, as defined by the Farmland Protection Policy Act, in the BMD.
Noxious weeds and invasive, non-native species			√	See Section 3.2.6
Native American cultural concerns			√	See Section 3.2.10
Floodplains			√	See Section 3.2.4
Riparian/wetlands			√	See Section 3.2.4
Threatened or endangered species			√	See Sections 3.2.5 and 3.2.7
Migratory birds			√	See Sections 3.2.7
Waste, hazardous/solid			√	See Sections 3.2.16
Water			√	See Sections 3.2.4
Wild and Scenic Rivers	√			The proposed parcels are not located in or near any designated Wild and Scenic Rivers.
Wilderness and Wilderness Study Areas (WSAs)	√			None of the proposed parcels are within a designated Wilderness or WSA.
Lands with wilderness characteristics	√			None of the proposed parcels are within lands with wilderness characteristics. Map in SI Section 13.

Table 2. Other resources considered in the EA.

Other Resources	Not Present	Present/Not Affected	Present/May be Affected	Rationale
Fire management		√		Standard fire management stipulations would be included in any lease sale. Any potential impacts from subsequent exploration and development activities would be analyzed under a separate, project specific analysis.
Forestry and woodland products	√			No Forestry or woodland products exist in the analysis area.
Geology and minerals			√	See Section 3.2.13
Land use authorization			√	See Section 3.2.14; map in SI Section 13.
Paleontological resources	√			All of the rock units within the nominated parcels have low potential for significant paleontological resources; however, best management practices or conditions of approval would apply in the event a significant paleontological resource were encountered as a result of any ground-disturbing oil and gas exploration or development activities. To help minimize any potential effects to paleontological resources, a standard Lease Notice, NV-B-00-A-LN, regarding fossils is included in Stipulations and attached to all parcels.
Rangeland resources			√	See Section 3.2.8; map in SI Section 13.
Recreation		√		See Section 3.2.11; map in SI Section 13.
Socioeconomic values			√	See Section 3.2.15; map in SI Section 13.
Soils			√	See Section 3.2.3
Specially designated areas			√	See Section 3.2.11
Special status species			√	See Section 3.2.5 (plants) and 3.2.7 (animals); SI Sections 3 and 6.
Vegetation			√	See Section 3.2.5, map in SI Section 13.
Visual resources		√		See Section 3.2.12 map in SI Section 13.
Wild horses and burros	√			None of the lease sale parcels overlap HMA boundaries.
Wildlife			√	See Section 3.2.7; map in SI Section 13.

3.1.7 Environmental Consequences of Alternative C – No Leasing (All Resources)

Under this alternative, no parcels would be offered for leasing in February 2022. Because the RFD scenario applies to BMD, potential effects that are the same or essentially similar to those of the Proposed Action described for each resource would be expected to occur on other already leased parcels in the District; although the total number of wells may be slightly decreased if less lands or lower potential

lands are available for leasing. As oil and gas production is demand driven, additional production may take place in other states or regions of the world to produce the required fossil fuels.

3.2 Environmental Effects of Alternative A or 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 – Removing parcel lands that overlap the WMA. This analysis is tiered to the respective 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 analysis area varies by resource, and generally includes lease parcels of Federal minerals for oil and gas leasing in Nye County, central Nevada.

Table 3. Alternative Action Table

Designation	Alternative	Number of Parcels	Area (acres)
A	Proposed Action	10	10,496.59
B	Removing parcel lands inside WMA	5	2,560.00
C	No leasing	0	0

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

3.2.1.1 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.

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

The EPA air quality index (AQI) is an index used for reporting daily criteria pollutant levels to the public (<https://www.airnow.gov/>). The AQI index is one way to evaluate how clean or polluted an area's air is and whether associated health effects might be a concern. The EPA calculates a daily AQI based on local air monitoring data. When the AQI value is between 0 and 50, air quality is categorized as "good" and criteria air pollutants pose little or no risk. Air monitoring data and daily AQIs are available near the proposed lease areas in the counties shown in Table 4. AQI data shows air quality is generally good within the analysis area and that there is little risk to the general public from poor air quality based on available data for the most recent 5-year period (2016-2020).

Table 4. Air Quality Index Data 2016-2020

County	Avg Days with AQI per year	Avg Days Rated Good	Avg Days Rated Moderate	Avg Days Rated unhealthy ¹	% Days Rated Good	% Days Rated Moderate	% Days Rated Unhealthy
Nye	365	348	15	1.5	95%	4%	<1%
White Pine	359	288	69	3.3	80%	19%	<1%

¹ includes days rated Unhealthy for Sensitive Groups, Unhealthy, Very Unhealthy, and Hazardous

Source: EPA Air Data (EPA 2020) <https://www.epa.gov/outdoor-air-quality-data>

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 are the John Muir Wilderness, approximately 180 miles southwest of the southernmost lease parcels, and the Jarbidge Wilderness, approximately 225 miles north of the

northernmost lease parcel.

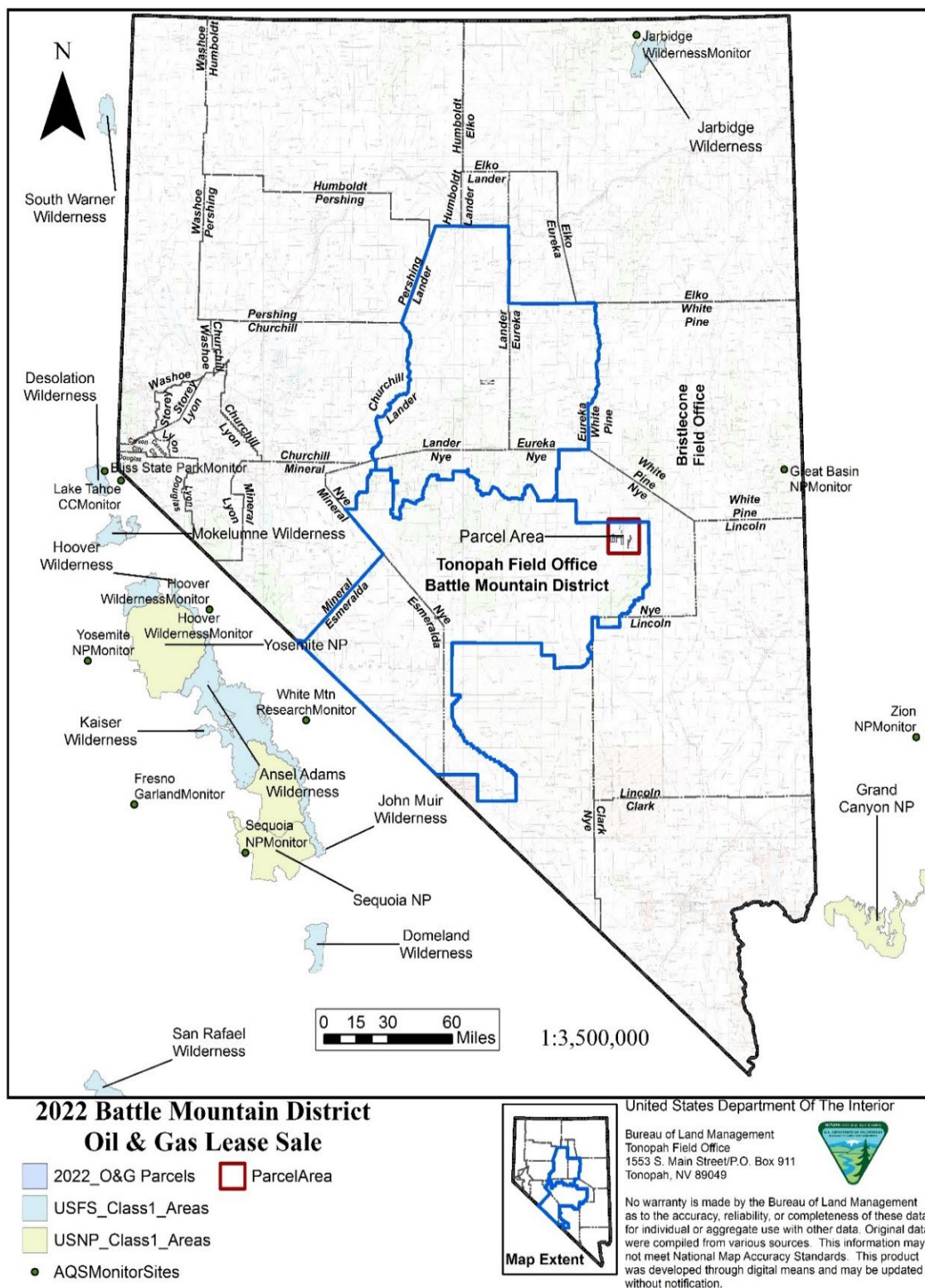
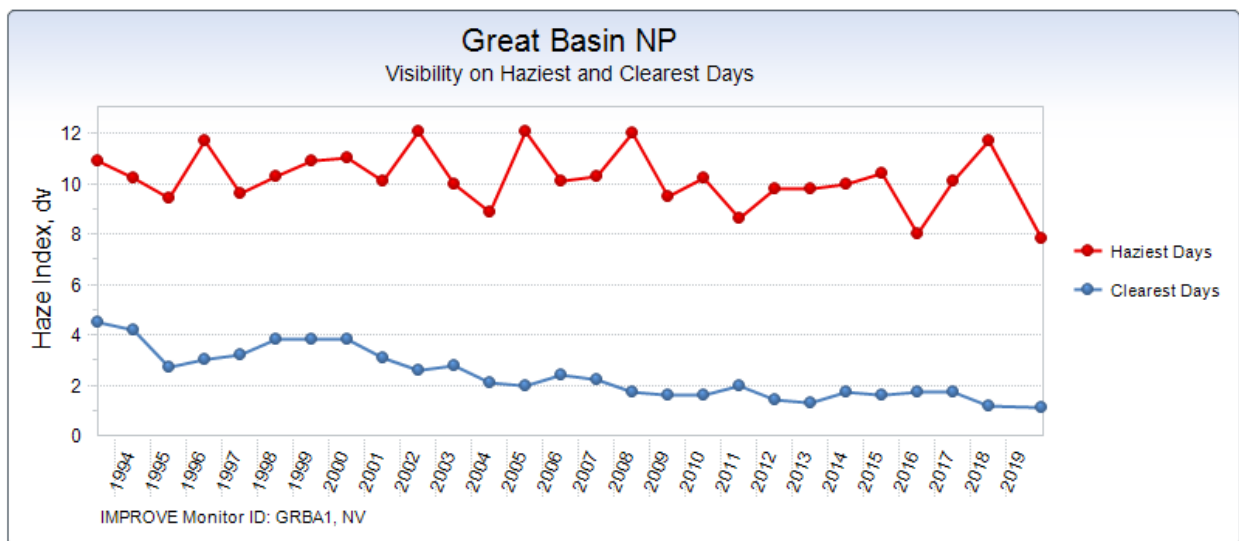


Figure 5. Air monitoring stations near the Battle Mountain District. Class I Air Quality Areas.

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 80 miles east of the proposed lease sale parcels, is the closest monitoring station for visibility. The figure below shows current visibility trends at GBNP, an area that could potentially be affected from development on proposed lease sale parcels. GBNP is not a Class I area.



Source: IMPROVE 2018 <http://vista.cira.colostate.edu/improve/aqrv-summaries/>

Figure 6. 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.

3.1.1 Environmental Consequences of Alternative A - 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 possible to feasibly quantify potential air quality effects via methods such as dispersion modeling; however, projected maximum year and average year CAP and HAP emissions based on the RFD scenario are presented in Table 5.

Table 5. Estimated maximum year and average year Criteria and Hazardous Air Pollutants.

Activity	PM ₁₀	PM _{2.5}	VOC	NO _x	CO	SO ₂	HAPs
Max Year	24.6	3.2	64.2	20.9	18.7	1.904	7.425
Average Year	12.4	1.5	48.7	6.7	6.7	0.489	5.692

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. Considering the proposed lease parcel location within known fields, it is anticipated that the potential for oil production is low. Historically in the lease area 95% of exploration results in dry holes, less than 20% of completed wells produce commercially viable quantities of oil, and no commercial quantities of gas have been discovered. Future effects to air quality, visibility, and atmospheric deposition from leasing and existing development would be similar to past years. Accordingly, estimated emissions presented in Table 5 are conservative and represent a total of 25 wells drilled, with two (2) of those wells coming into production.

3.2.1.2 Environmental Consequences of Alternative B – Removing parcels that overlap the WMA

Effects on Air Quality would be similar to Alternative A – Proposed Action, because the RFD scenario does not change with the number of parcels offered.

3.2.1.3 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 (COAs) could be applied based on the environmental analysis for the APD. These control measures are dependent on emissions inventory and future modeling studies or other analysis or changes in regulatory standards.

3.2.2 Greenhouse Gas (GHG) and Climate Change

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

For the purposes of this analysis, the BLM has evaluated the potential effects of the proposed leasing action on climate change by estimating and analyzing potential GHG emissions from projected oil and

gas development on the parcels proposed for leasing using estimates based on past oil and gas development and available information from existing development within the State.

Additional 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 are included in the *BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends (2020)* (BLM, 2021) (hereinafter referred to as the Annual GHG Report). This report presents the estimated emissions of greenhouse gases attributable to 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 the analysis for this proposed lease sale and is available at <https://www.co.blm.gov/AirResourcesReport/ghg/>.

3.2.2.1 Affected Environment

Climate change is a global process that is affected by the sum total of GHGs in the Earth's atmosphere. 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. However, there are general projections regarding potential impacts on natural resources and plant and animal species that may be attributed to climate change from GHG emissions over time. 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 entire Earth's surface no matter their point of origin. Therefore, potential emissions from the proposed action can be compared to state, national and global GHG emission totals to provide context of their significance and potential contribution to climate change impacts.

Table 6 shows the total estimated GHG emissions from fossil fuels at the global and national scales over the last five years. Emissions are shown in Megatonnes (Mt) per year of carbon dioxide equivalent (CO₂e). Chapter 3 of the Annual GHG Report for additional information on greenhouse gases and an explanation of CO₂e. Table 7 shows GHG emissions data from the largest greenhouse gas emitting facilities as reported to the U.S. Environmental Protection Agency (EPA) through its Greenhouse Gas Reporting Program (GHGRP) for those states associated with this potential leasing action. Table 7 also shows energy-related CO₂ emissions as issued by the U.S. Energy Information Administration (EIA) in its annual State Energy-Related Carbon Dioxide Emissions Tables. State 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 4, 5, and 6).

Table 6. Global and U.S. GHG Emissions 2015 - 2019 (Mt CO₂/yr)

Scale	2015	2016	2017	2018	2019
Global	52,700	52,800	53,500	55,300	59,100
U.S.	5,249	5,153	5,083	5,244	5,107

Source: Annual GHG Report, Chap. 6, Table 6-1.

Mt (megatonne) = 1 million metric tons.

Table 7. State GHG Emissions

State	EPA - GHGRP Large Emitters (Mt CO ₂ /yr)			EIA Energy-related CO ₂ Emissions (Mt/yr)
	Total Reported	Power Plants	Petroleum and Natural Gas Systems	
Nevada	17.1	13.8	0.3	37.9

Sources: Annual GHG Report, Chap. 6, Table 6-3; Energy Information Administration
Mt (megatonne) = 1 million metric tons.

The continued increase of anthropogenic GHG emissions over the past 60 years has contributed to global climate change impacts. A discussion of past, current, and projected future climate change impacts is described in Chapters 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. These chapters are incorporated by reference in this analysis.

3.2.2.2 Environmental Consequences of Alternative A - Proposed Action

While the leasing action itself does not directly generate GHG emissions, such emissions are a reasonably foreseeable consequences of oil and gas development. There are three general phases of post-lease development that would generate GHG emissions that include 1) well development (well site construction, well drilling, and well completion), 2) production operations (processing, storage, and transport/distribution), and 3) end-use (combustion) of the fuels produced.

The BLM cannot develop a precise emissions inventory at the leasing stage due to uncertainties including the type (oil, gas, or both), scale, and duration of possible development, the types of related equipment (drill rig engine tier rating, horsepower, fuel type), or mitigation measures that a future lessee may propose in their development plan. In order to estimate reasonably foreseeable on-lease emissions at the leasing stage, the BLM uses estimated well numbers 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, reasonably foreseeable wells are assumed to produce oil and gas in similar amounts as existing nearby wells. As described in Section 3.2.1.2 above, this means that 23 of the 25 wells would not be expected to produce any oil. While the BLM has no authority to direct or regulate the end-use of the products, for this analysis, the BLM assumes all produced oil or gas will be combusted (such as for domestic heating or energy production). The BLM acknowledges that there may be additional sources of GHG emissions along the distribution, storage, and processing chains (commonly referred to as midstream operations) associated with production from the lease parcels. These sources may include emissions of methane (a more potent GHG than CO₂ in the short term) from pipeline and equipment leaks, storage, and maintenance activities. At the leasing stage, these sources of emissions are highly speculative, and the BLM has therefore chosen to assume, for the purposes of this analysis, that all produced oil or gas will be combusted. We note, however, that the potential emissions from these sources have been estimated and are accounted for in the cumulative assessment of GHGs from BLM's fossil fuel leasing program.

The emissions used in this analysis are estimated as described above using the BLM Lease Sale Emissions Tool. Emissions are presented for each of the three phases described above.

- Well development emissions occur over a short period and include heavy equipment and vehicle exhaust, drill rig engine emissions, completion equipment, pipe venting, and emissions from any well treatments such as hydraulic fracturing that may be used.
- Production 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.
- End-use emissions occur from the downstream combustion of produced oil or gas. End-use emissions are estimated by multiplying the estimated ultimate recovery (EUR) of produced oil and gas with emissions factors for combustion established by the EPA (Tables C-1 and C-2 to Subpart C of 40 CFR § 98). Additional information on emission factors and EUR factors can be found in the Annual GHG Report (Chapter 4). Table 8 and Table 9 list the estimated direct and indirect GHG emissions in metric tons for the proposed lease sale over the average 30-year production life of the lease.

Table 8. Estimated Life of Lease Emissions (On-Site) from Well Development and Production Operations (Metric tonnes)

Activity	CO ₂	CH ₄	N ₂ O	CO ₂ e (100-yr)	CO ₂ e (20-yr)
Well Development	36,415	312.36	0.219	47,725	63,962
Production Operations	22,583	316.69	0.057	34,000	50,467

Source: BLM Lease Sale Emissions Tool

Table 9. Estimated Life of Lease Indirect Emissions from the End-Use Combustion of Produced Oil and Gas (Metric tonnes and Mt)

	EUR (bbl or mcf)	CO ₂	CH ₄	N ₂ O	CO ₂ e (100-yr)	CO ₂ e Mt (100-yr)	CO ₂ e (20-yr)
Oil	103,886	44,882	1.81	0.361	45,054	0.045	45,137
Gas	0	0	0.00	0.000	0	0	0
Total End-Use	-	44,882	1.81	0.361	45,054	0.045	45,137

Source: BLM Lease Sale Emissions Tool

GHG emissions vary annually over the production life of a well due to declining production over time. Table 10 provides maximum year and average year emissions over the life of the lease. Figure 6 shows the estimated annual GHG emissions profile over the production life of a typical lease including well development, well operation, end-use, and gross (total of well development, well production, and end-use) emissions. In the BMD, as described in Section 3.2.2.1 and shown on this chart, well development could take as long as ten years and only two of 25 wells are expected to produce oil, thus maximum emissions are reached in year 10 and decline over the life of the lease.

Table 10. Estimated Direct and Indirect Emissions from the Lease Parcels on an Annual and Life of Lease basis (Metric tonnes and Mt)

	CO ₂	CH ₄	N ₂ O	CO ₂ e (100-yr)	CO ₂ e Mt (100-yr)	CO ₂ e (20-yr)
Max Year	7,875	41.93	0.1	9,400.4	0.009	11,579
Average Year	2,663.6	16.2	0.0	3,250.8	0.003	4,091
Life of Lease	103,880	630.9	0.6	126,780	0.013	159,565.6

Mega tonne (Mt) = 1 million metric tons.

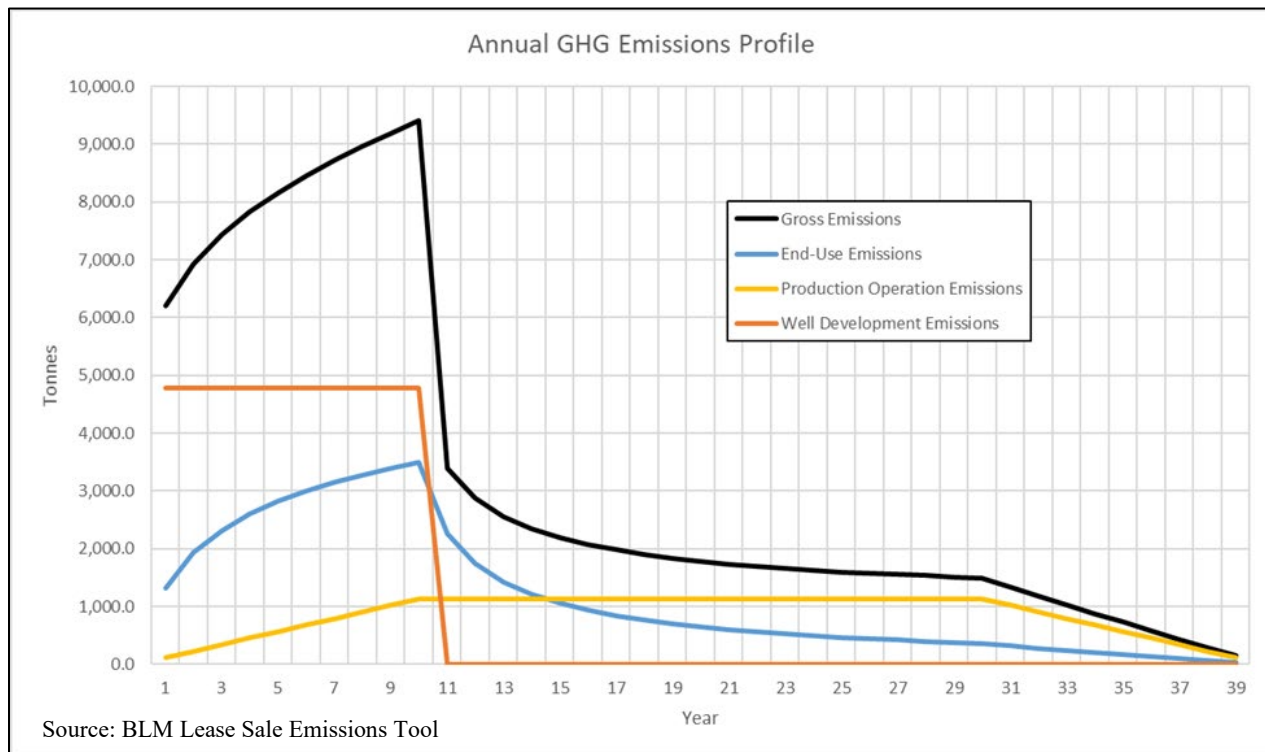


Figure 7. Estimated Annual GHG Emissions Profile over the Life of a Lease

In order to put the estimated GHG emissions for this lease sale in context, potential emissions that could result from development of the lease parcels for this sale can be put into relatable terms by comparing to other common activities that generate GHG emissions as well as to emissions at state and national scales. The EPA GHG equivalency calculator can be used (<https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>) to express the potential average year GHG emissions on a scale relatable to everyday life. For instance, the projected average annual GHG emissions from expected development following the proposed lease sale are equivalent to 707 gasoline-fueled passenger vehicles driven for one year but can be avoided by building and operating 1 new wind turbine as an alternative energy source or offset by the carbon sequestration of 3,964 acres of forest land.

Table 11 compares estimated maximum and average annual lease-sale emissions to existing State GHG emissions, federal BLM fossil fuel (oil, gas, and coal) emissions, and U.S. fossil fuel and total GHG emissions reported in the EPA Inventory of U.S. GHG Emissions and Sinks: 1990-2019 (U.S. Environmental Protection Agency (EPA), 2021).

Table 11. Comparison of Lease Sale Annual Emissions to Other Sources (Mt)

Reference	Mt CO ₂ e ¹ (Per Year)	Average Year % of Reference	Max Year % of Reference
Max Year	0.009	-	-
Average Year	0.003	-	-
Nevada Federal (Oil & Gas)²	0.1	2.501%	7.231%
Nevada Federal (Oil, Gas and Coal)²	0.1	2.501%	7.231%

Reference	Mt CO ₂ e ¹ (Per Year)	Average Year % of Reference	Max Year % of Reference
U.S. Federal (Oil & Gas) ²	427.7	0.001%	0.002%
U.S. Federal (Oil, Gas and Coal) ²	918.6	0.000%	0.001%
U.S. Total ³	6,576.1	0.000%	0.000%

1. Estimates are based on 100-GWP values provided by AR-5 (IPCC, 2014)

2. Federal values come from the BLM Specialist Report on Annual Greenhouse Gas Emissions.

3. U.S. Values comes from the EPA Inventory of U.S. GHG Emissions and Sinks: 1990-2019.

Table 12. Comparison of the Life of Lease Emissions to other Federal Oil and Gas Emissions from Existing Wells, Development of Approved APDs, and Other Leasing Actions in the State and Nation.

Reference	Mt CO ₂ e (100-yr)	Life of Lease % of Reference
Life of Lease	0.13	100.00%
NV Reasonably Foreseeable Short-term Federal (O&G)	3.14	4.04%
NV EIA Projected Long-term Federal (O&G)	4.29	2.96%
U.S. Short-term Federal (O&G)	4,735.20	0.003%
U.S. Long-term Federal (O&G)	10,199.61	0.001%

Source: U.S. and Federal emissions from BLM Lease Sale Emissions Tool and Annual GHG Report

Compared to emissions from other existing and foreseeable Federal oil and gas development, the life of lease emissions for the Proposed Action is between 2.5% and 7.2% of Federal fossil fuel authorization emissions in the state and between 0.001% to 0.002% of Federal fossil fuel authorization emission in the nation. Historical records indicate that the RFD scenario of 25 wells over 10 years is highly unlikely, Nevada oil plays are compartmentalized and discontinuous, this is supported by the fact that less than 20% of drilled wells in Nevada will produce oil.

In summary, potential GHG emissions from the Proposed Action could result in GHG emissions of 0.13 MT CO₂e over the life of the lease.

3.2.2.3 Monetized Impacts from GHG Emissions

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.

On January 20, 2021, President Biden issued E.O. 13990, *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis*⁴. Section 1 of E.O. 13990 establishes an Administration policy to, among other things, listen to the science; improve public health and protect our environment; ensure access to clean air and water; reduce greenhouse gas emissions; and bolster resilience to the impacts of climate change⁵. Section 2 of the E.O. calls for Federal agencies to review

⁴ 86 FR 7037 (Jan. 25, 2021).

⁵ *Id.*, sec. 1.

existing regulations and policies issued between January 20, 2017, and January 20, 2021, for consistency with the policy articulated in the E.O. and to take appropriate action.

Consistent with E.O. 13990, the Council on Environmental Quality (CEQ) rescinded its 2019 “Draft National Environmental Policy Act Guidance on Considering Greenhouse Gas Emissions” and has begun to review for update its “Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews” issued on August 5, 2016 (2016 GHG Guidance)⁶. While CEQ works on updated guidance, it has instructed agencies to consider and use all tools and resources available to them in assessing GHG emissions and climate change effects including the 2016 GHG Guidance⁷.

Regarding the use of Social Cost of Carbon or other monetized costs and benefits of GHGs, the 2016 GHG Guidance noted that NEPA does not require monetizing costs and benefits⁸. It also noted that “the weighing of the merits and drawbacks of the various alternatives need not be displayed using a monetary cost-benefit analysis and should not be when there are important qualitative considerations.”⁹

Section 5 of E.O. 13990 emphasized how important it is for federal agencies to “capture the full costs of greenhouse gas emissions as accurately as possible, including by taking global damages into account” and established an Interagency Working Group on the Social Cost of Greenhouse Gases (the “IWG”).¹⁰ In February of 2021, the IWG published *Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide: Interim Estimates under Executive Order 13990* (IWG, 2021).¹¹ This is an interim report that updated previous guidance from 2016. The final report is expected in January 2022.

In accordance with this direction, this subsection provides estimates of the monetary value of changes in GHG emissions that could result from selecting each alternative. Such analysis should not be construed to mean a cost determination is necessary to address potential impacts of GHGs associated with specific alternatives. 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. BLM has not completed an economic analysis for this lease sale, monetized major costs or benefits or revenue streams from the proposed action. The proposed parcels are located in the remote area of Railroad Valley, over 60 miles from the nearest town that would benefit from revenue streams related to oil and gas development. The assumptions made for GHGs based on the RFD scenario, show that only two of 25 wells would be expected to be developed. Additionally, the presence of a producing field and infrastructure already in place would reduce the impacts to employment numbers and labor income. 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 (SC-CO₂), methane (SC-CH₄), and nitrous oxide (SC-N₂O) developed by the Interagency Working Group (IWG) on the SC-GHG. Select estimates are published in the Technical Support Document (IWG 2021)¹² and the complete set of annual estimates are available on the Office of

⁶ 86 FR 10252 (February 19, 2021).

⁷ *Id.*

⁸ 2016 GHG Guidance, p. 32, available at: https://ceq.doe.gov/docs/ceq-regulations-and-guidance/nepa_final_ghg_guidance.pdf

⁹ *Id.*

¹⁰ E.O. 13990, Sec. 5.

¹¹ https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf

¹² IWG 2021. *Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide, Interim Estimates under Executive Order 13990*. Interagency Working Group on Social Cost of Greenhouse Gases, February 2021.

Management and Budget's website¹³.

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).

As expected with such a complex model, there are multiple sources of uncertainty inherent in the SC-GHG estimates. Some sources of uncertainty relate to physical effects of GHG emissions, human behavior, future population growth and economic changes, and potential adaptation (IWG 2021). To better understand and communicate the quantifiable uncertainty, the IWG method generates several thousand estimates of the social cost for a specific gas, emitted in a specific year, with a specific discount rate. These estimates create a frequency distribution based on different values for key uncertain climate model parameters. The shape and characteristics of that frequency distribution demonstrate the magnitude of uncertainty relative to the average or expected outcome.

To further address uncertainty, the IWG recommends reporting four SC-GHG estimates in any analysis. Three of the SC-GHG estimates reflect the average damages 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 damages estimated, applying a 3% annual discount rate for future economic effects. This is a low probability, but high damage scenario, represents an upper bound of damages within the 3% discount rate model. The estimates below follow the IWG recommendations.

The SC-GHGs associated with estimated emissions from future potential development of the lease parcels are reported in Table 13. These estimates 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, as described in Subsection 3.2.2.2. 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. They are rounded to the nearest \$1,000. The estimates assume development will start in 2032 and end-use emissions complete in 2062, based on experience with previous lease sales.

¹³ <https://www.whitehouse.gov/omb/information-regulatory-affairs/regulatory-matters/#scghgs>

Table 13. SC-GHG Associated with Future Potential Development

	Social Cost of GHG (2020\$)			
	Average Value, 5% discount rate	Average Value, 3% discount rate	Average Value, 2.5% discount rate	95 th Percentile Value, 3% discount rate
Development and Operations	\$1,073,000	\$3,646,000	\$5,383,000	\$10,679,000
End-Use	\$543,000	\$2,080,000	\$3,158,000	\$6,289,000
Total	\$1,616,000	\$5,726,000	\$8,541,000	\$16,968,000

3.2.2.4 Estimated GHG Emissions for Reasonably Foreseeable Environmental Trends and Planned Actions

The analysis of GHGs contained in this EA includes estimated emissions from those parcels being offered in this lease sale as described above. In addition to this lease sale, the BLM is offering parcels in six other BLM administrative units within the first quarter of 2022. The estimated GHG emissions from parcels being offered in each of those individual sales is contained in the associated EA for each sale. When analyzing the potential impacts from multiple lease sales, it is important to note that it is the actual production of fossil fuel commodities on leased parcels that generates GHG emissions and not the offering of acres or parcels for lease in a particular grouping of lease sales. Parcels offered in a lease sale may or may not be sold and sold parcels may or may not go into production for several years if at all. Typically, lease sales in different BLM administrative units are not offered on the same date and each administrative unit has deference to defer its sale or defer or add parcels as a result of scoping and protests. The dynamic nature of the lease sale process and independence of each administrative unit for constructing its lease sales, precludes an analysis of potential GHG emissions that could occur from other lease sales that might occur in the same quarter. In addition, combining all of the offered parcels from multiple lease sales that may occur over a 3-month period and assuming all acres will be sold and produce immediately, and estimating GHG emissions from development on the offered acreage based on these assumptions would result in an inflated, unrealistic, quantity of estimated emissions that would not be useful to the decision maker and would not accurately inform the public of the magnitude of probable cumulative emissions and impacts.

An assessment of GHG emissions from BLM's fossil fuel authorizations including coal leasing and oil and gas development is included in the BLM Specialist Report on Annual GHG Emissions (referred to as Annual Report, see Chapter 5). The Annual Report includes estimates of all reasonably foreseeable GHG emissions related to BLM lease sales anticipated during the calendar 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 Report provides a more probable estimate of short-term and long-term GHG emissions from lease sale activity across the BLM. The short-term methodology presented in the Annual Report includes a trends analysis of (1) leased federal lands that are held-by-production, (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 projection of potential emissions from Federal 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 oil and gas development. 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 Report and represent both a hard look at GHG emissions from fossil fuel leasing and the best available estimate of reasonably foreseeable cumulative emissions related to any one lease sale or set of quarterly lease sales. Table 14 shows the cumulative estimated GHG emissions from the development of the projected lease sale acres in 2021 using the methodology described above. The 5-year lease averages include all types of oil and gas development related leases, including leases granted under the Mineral Leasing Act as well as other authorities, that have been issued over the last five years. As such the projections made from the 5-year averages represent the potential for all types of future potential oil and gas leasing activity. However, they may also over-estimate the potential emissions from the 12-month cycle of competitive oil and gas leasing activities if the projected lease sale activity does not actually occur.

Table 14. Reasonably Foreseeable Projected Emissions

State (BLM Administrative Unit)	Annual Report Table 4-8 Projected Lease Acres 2021	Annual Report Figure 5-1 GHG Emissions from Projected Lease Acres 2021 (Mt CO_{2e} per year)
Alabama (ES)	1	0.00
Alaska	356,021	9.33
Arkansas (ES)	536	0.04
California	184	0.02
Colorado	67,268	10.21
Idaho	1,881	0.03
Kansas (ES)	287	0.02
Kentucky (ES)	37	0.01
Louisiana (ES)	9,334	2.59
Michigan (ES)	5,006	0.17
Mississippi (ES)	2,609	0.06
Montana	60,807	2.48
Nebraska (WY)	19	0.01
Nevada	155,583	0.29
New Mexico	38,926	22.90
North Dakota (MT)	2,477	0.07
Ohio (ES)	681	0.18
Oklahoma (NM)	2,052	0.05
South Dakota (MT)	1,543	0.02
Texas (NM)	1,602	0.09
Utah	141,832	9.13
West Virginia (ES)	42	0.01
Wyoming	562,985	88.87
Total	1,411,713	146.56
Proposed Action		0.13
Reasonably Foreseeable Cumulative Total		146.69

3.2.2.5 Environmental Consequences of Alternative B – Removing parcels that overlap the WMA

Effects on GHG and Climate change would be similar to Alternative A – Proposed Action, because the RFD scenario does not change with the number of parcels offered.

3.2.2.6 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 a result, no new GHG emissions from the development of these lease parcels would occur and no emissions from development activities on the parcels would contribute to national and global GHG emissions that influence climate change.

EIA studies regarding short-term “supply disruptions” suggest that reducing domestic supply (in the near-term under the current supply / demand scenario) would 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. The EIA 2021 AEO long-term energy outlook for the high U.S. domestic natural gas supply scenario describes a potential 1.2% growth in natural gas-related GHG emissions for the power sector through year 2050 and an almost 3% decline in coal-related emissions over the 30-year period. For the EIA projected low oil and gas supply scenario, power sector related GHG emissions reduce for both natural gas and coal through the period and at a smaller relative percentage for coal resulting in coal-related emissions still being higher than those associated with natural gas at year 2050 (U.S. Energy Information Administration (EIA), 2021).

3.2.2.7 Mitigation Strategies

GHG emissions contribute to changes in atmospheric radiative forcing resulting in climate change impacts. 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. The buildup of these gases has contributed to the current changing state of the climate equilibrium towards warming. Chapters 8 and 9 of the Annual Report provides a detailed discussion of climate change science, trends, and impacts. 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 Report provides a more detailed discussion of GHG mitigation strategies.

The Federal government 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.

(NDEP BAPC manages the greenhouse gas emissions inventory for the State of Nevada, you can find the information here: https://ndep.nv.gov/uploads/air-pollutants-docs/ghg_report_2020.pdf).

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 BLM assesses its specific location, design and proposed operation. 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 on stationary combustion sources, mobile combustion sources, fugitive sources, and process emissions occurring on a lease parcel. Analysis and approval of future development may include application of BMPs within BLM's authority, as Conditions of Approval, to reduce or mitigate GHG emissions. Additional measures developed at the project development stage also 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 the Annual GHG Report.

3.2.3 Soils

3.2.3.1 Affected Environment

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

Existing soils surveys are used to for evaluating land-use potential, potential plant communities and developing reclamation and rehabilitation plans. Three major soil orders dominate the Analysis Area: Aridisols, Entisols, and Inceptisols. A brief description of each soil order is provided in SI Section 2.

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

3.2.3.2 Environmental Consequences of Alternative A - Proposed Action

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

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

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

A CSU stipulation for slopes greater than 30 percent requires engineering and reclamation that would avoid impacts, wherever these slopes exist on a parcel. Using GIS all proposed parcels were examined for slopes greater than 30 percent and none were found to meet the criteria for stipulation. Sensitive riparian/wetland area soils generally have high susceptibility to disturbance and alteration; these would be protected by the Water Resources stipulation, applied to all or part of the 10 parcels. The degree of

protection would be adequate because vulnerable soils would not be expected to extend beyond the area within which impacts would not be allowed (within 500 feet of wetland/riparian areas, floodplains or playas).

3.2.3.3 Environmental Consequences of Alternative B – Removing parcels that overlap the WMA

Effects on soils would be similar to Alternative A – Proposed Action, because the RFD does not change based on the number of parcels being offered. There could be future development on parcels already leased in the WMA, thus soils could be affected if those leases were developed; however, all future proposals on existing lease parcels would be subject to additional NEPA analysis and the effects to soils would be identified and/or mitigated through BMPs or COAs.

3.2.4 Water

The lease area is part of the Basin and Range Physiographic Province, a semiarid and arid desert environment with most precipitation originating as snow or occasional monsoon rainfall. Daily weather station data collected at the Blue Eagle climate station indicates the average annual precipitation is 8.5 inches, and snowfall generally occurs from November through April. The highest temperatures (average 94.7°F) are reached in July and the lowest temperatures (average 16.5°F) are reached in January (Western Regional Climate Center, 1978-2016). The Blue Eagle climate station is located 1 mile east of parcel NV-2022-02-1512. Evapotranspiration rates in the vicinity of the proposed lease parcels in BMD (Hydrographic Areas 173B-Railroad Valley, Northern Part) range from about 4.6 to 4.9 acre-feet each year (Nevada Division of Water Resources (NDWR), 2020).

3.2.4.1 Affected Environment

Surface water: The proposed lease parcels in BMD are located in Hydrographic Region 16, Great Basin. The lease parcels are located within the Hot Creek-Railroad Valley watershed sub-basins. Many of the surface water features in the analysis area are the result of artesian flow of groundwater from wells: examples include Lockes Ponds, Big Well Ponds, and Blue Eagle Ponds. Other surface water features surrounding the analysis area are spring sources: examples include Blue Eagle Spring, Tom Spring, Kate Spring, North Spring, and Reynolds Spring.

Water is a fundamental component of ecosystem health, especially in arid regions where state appropriative water rights, springs, seeps, wetlands, ephemeral, and perennial streams are essential to biodiversity and play an important role in wildlife habitat and in the food chain for many wildlife taxa. The water quality of surface waters supports a variety of uses. The surface water quality standards of Nevada support Federal laws such as the Clean Water Act of 1977, the Water Resources Planning Act of 1962, the Pollution Prevention Act of 1990 and the Safe Drinking Water Act of 1977 and are administered by the Nevada Division of Water Quality (NDWQ). Additional information may be found at the NDWR website (<http://water.nv.gov/>) using the legal land descriptions for each parcel.

Riparian/Wetland Zones: Riparian and wetland areas are the most productive and important ecosystems in the District. While they represent less than one percent of the area in the District, they contain the majority of the biodiversity and perform vital ecologic functions. Research has shown that riparian and wetland habitat characteristically have a greater diversity of plant and animal species than adjoining areas. According to the National Hydrography Dataset and the National Wetlands Inventory, a few parcels proposed for lease contain springs and seeps, perennial streams, playas, or wetlands.

Groundwater: The Project is located in the Northern Part of the Railroad Valley hydrographic basin, designated as basin number 173B by the NDWR. The basin is approximately 2,149 square miles (mi²) with an estimated perennial yield of 75,000 acre-feet (AF).

Surface water runoff from upland areas of the Project infiltrates pediment deposits and transitions into the basin. Groundwater is either directed toward playas or is lost to the atmosphere and vegetation as evapotranspiration, or seeps into deeper aquifers that compose larger regional flow systems. Perennial base flow from springs is largely driven by snowmelt runoff recharge. Depth to groundwater varies from a few feet to hundreds of feet depending on location.

Nevada's groundwater quality standards are based on the assumption that groundwater should be maintained suitable for use as a drinking water source, unless the natural water quality prevents this. The State adopts the Federal primary and secondary drinking water standards (maximum contaminant limits) for groundwater resources. The chemical character and quality of groundwater varies in the lease area and depends largely on the mineral content of the rock, residence time, evapotranspiration and temperature.

Floodplains: The 100-year floodplain serves as the basis for floodplain management on public lands. The Federal Emergency Management Agency (FEMA) classifies areas with a one-percent chance to be flooded during a 100-year, 24-hour runoff event as Zone A, Zone AH or Zone AE flood hazard areas. Areas with a 0.2 percent annual chance to be flooded during a 500 year, 24-hour runoff event are classified as Zone X (FEMA, 2015). Areas identified within Zone A, AH, or AE flood hazard areas would be subject to federal regulation and mitigation. Further, parcels containing Zone D mapped floodplains (where there are possible but undetermined flood hazards, as no analysis of flood hazards has been conducted) have flooding risk and potential and mitigation is recommended similar to Zone A, AH, or AE mapped floodplains. Additional, project-specific, NEPA analysis to identify potential effects to floodplains and, if needed, alternative to avoid such effects, would be required prior to drilling in parcels that meet this designation, as per E.O. 11988 Section 2(a)(2) and FEMA guidelines (FEMA, 2015).

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

Where secured by any entity, state appropriative water rights that are beneficially used promote land uses based on the prior appropriation doctrine, or "first in time-first in right." Thus, the older the water right, the more seniority the water use and water right holder has to protect its right from other uses and over-appropriation of surface and groundwater resources that would limit or end the water source's use. Proposed lease parcels are located in the 173B-Railroad Valley-Northern Part of NDWR hydrographic area.

3.2.4.2 Environmental Consequences of Alternative A - Proposed Action

HF is one method of well stimulation used in oil and gas production, though in Nevada only five wells have used HF and only one was successful. HF is designed to change the producing formations' physical properties by increasing the flow of water, gas, and/or oil around the wellbore. This change in physical properties may open up new fractures or enhance existing fractures that could result in freshwater aquifers being contaminated by natural gas, condensate and/or chemicals used in drilling, completion and HF. Historically, impacts to groundwater resources are due to improper well construction including insufficient or poorly installed surface and/or borehole seals (cementing), unsuitable construction materials and/or inadequate construction practices, introduction of surface contaminants into groundwater through surface spills, and/or loss of drilling, completion and hydraulic fluids into groundwater. Types of

chemical additives used in completion activities may include acids, hydrocarbons, gelling or thickening agents, lubricants, and other additives that are specific for the well being treated.

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

Exploration and development of a lease may result in long-and short-term alterations to the hydrologic regime depending upon the location and intensity. The U.S. EPA (2016) identifies six activities are most likely to cause potential impacts to waters in some circumstances from hydraulic fracturing to develop oil and gas production when management controls are not adequate. These are: 1) Water withdrawals impacting groundwater resources; 2) Spills of hydraulic fracturing fluids or chemicals or produced water with chemicals that reach groundwater resources; 3) Wells lacking mechanical integrity allowing gases or liquids to migrate into groundwater; 4) Injection of hydraulic fracturing fluids into groundwater; 5) Inadequately treated hydraulic fracturing waste water into surface water resources; and 6) Infiltration of hydraulic fracturing wastewater into groundwater from unlined pits.

Standard BMPs and COAs include the use of lined pits with secondary containment and monitoring features for any flow-back or produced fluids which are designed to prevent any infiltration or other contamination of groundwater or surface water resources.

Additionally, clearing, grading, and soil stockpiling related to the construction and maintenance of oil and gas production infrastructure could alter short-term overland flow and natural groundwater recharge patterns, but in most cases, these potential impacts can be mitigated by better location siting and engineering controls and the CSU for steep slopes greater than 30%. The BLM may move a proposed well site up to 200 meters at its discretion to mitigate water resource impacts, and the requirements of the Clean Water Act may necessitate relocating the well further.

Surface Waters: Proposed lease sale parcel NV-2022-02-1499 straddles Big Well Ponds area, parcel NV-2022-02-1507 is adjacent to Lockes Ponds, and parcel NV-2022-02-1512 edges the Blue Eagle Emergent Wetland Area. Runoff associated with storm events could increase sediment and salt loads in surface waters down-gradient of the disturbed areas. Sediment may be deposited and stored in minor drainages where it could move downstream during heavy storms and may be carried into contained basins and sloughs. This would be especially true in areas with steep slopes, which would be more susceptible to erosion and consequent deposition into perennial streams, springs and seeps, and wetlands and riparian areas.

Springs, Seeps, Riparian and Wetland Areas: Analysis of various water data show that three of the 10 proposed lease parcels overlap a playa boundary. In addition, six parcels overlap a U.S. FWS freshwater emergent wetland. The consequences of oil and gas exploration or development in wetlands and riparian areas are potentially severe, as these environments are extremely sensitive to perturbation. The hydrogeology that results in spring discharge is often unique and complex. For springs, seeps, and spring-fed wetlands, there would be a slight risk that drilling would lead to subsurface modification due to the

possibility that drilling would interfere with groundwater flow in a fault. For any future proposed drilling, geophysical studies may be required which provide a subsurface view of the strata and their permeability, in which case the likelihood of penetrating a fault with groundwater flow would be minimized.

The predicted surface disturbance, although minor in area, would have a disproportionate effect in these environments. Road building could redirect water flows; any loss or diversion of water or instream flow can affect wetland and riparian health and their ecosystems. Contaminants from any accidental spillage are easily brought into solution and spread throughout the system. Human activity can affect turbidity and dissolved oxygen content, which in turn harm microbial life.

Only two of the 10 proposed parcels lack sensitive water resources not requiring the Water Resources stipulation NV-B-10-B-CSU. The Water Resources stipulation has been applied to all or portions of eight of 10 proposed lease sale parcels. This stipulation employs Controlled Surface Use (CSU) restrictions with measures designed to protect water resources and prevent erosion by using avoidance buffers, engineering controls, and mitigation for these resources wherever they may occur within a parcel. Proper application of the stipulation will protect water resources from unnecessary or undue degradation. It is applied to the $\frac{1}{4}$ $\frac{1}{4}$ sections that encompass the target resource to ensure even the smallest area of surface water resources would be protected while maximizing the area available for lease. The proposed combination of avoidance buffers, engineering controls and mitigation requirements, along with the additional project and site-specific analysis and Conditions of Approval at the exploration and development stage, will meet the requirements of Executive Order 11988, Executive Order 11990, The Safe Drinking Water Act, and The Clean Water Act of 1972, and provide sufficient protection for water resources on the parcels.

Floodplains: FEMA has not mapped all of the area of the lease parcels. The majority of parcels exist in lowlands surrounding existing known oil fields. Topography is alluvial fans and stream channels, and areas near valley bottoms where stream channels deliver surface water runoff to wetlands or playas and valley bottoms. Five of 10 of the parcels have Zone A floodplains (100-year floodplains). Four of the five parcels with FEMA mapped Zone A floodplains also have FEMA mapped Zone D floodplains located on the same parcel.

FEMA mapped D Zone floodplain designation is used for areas where there are possible but undetermined flood hazards, as no analysis of flood hazards has been conducted. Four of six parcels mapped Zone D are located near and typically downslope of spring complexes that influence the parcels with surface water discharge and contain clear evidence of aquatic vegetation on aerial photos. These four parcels clearly have water on them and include the risk of flooding as spring flow temporally ebbs and flows. The other two of six Zone D mapped parcels fringe large Zone A mapped floodplains and due to proximity to Zone A floodplains also run the risk of flooding. Development of Zone D floodplains clearly would adversely impact floodplain function and run the risk of experiencing flooding as localized development occurs except for isolated higher topographic areas that may or may not be located in Zone D floodplains.

Any oil and gas development infrastructure (wells, pads, other structures, roads, etc. or equipment used to support oil and gas development) may be subject to flooding or standing water that could compromise infrastructure and release and wash pollutants (oil and gas, sediment, materials stored onsite, or infrastructure debris) downstream to ephemeral channels, water rights, springs, seeps, riparian areas, wetlands, or playas. Additionally, oil and gas activities could place fill in flood areas or redirect surface waters and runoff such that areas might receive floodwaters.

Groundwater: All activities would be subject to BMPs, State and Federal Regulations and COAs. Potential future impacts of developing a lease may include degradation of water quality, drawdown of

existing water levels or possible impacts to drinking water sources should drinking water sources exist nearby in communication with fracking activities at depth. Water quality issues may arise from either underground or surface contamination. The primary cause of underground degradation would be from improperly functioning well casings. Surface activities can degrade groundwater quality by infiltration of contaminants, particularly from sumps and spills or possibly from hydraulic fracturing fluids. Areas with shallow groundwater levels would be at greater risk and may be subject to COAs. All required state and federal regulations would apply to any future development, and site-specific COAs and mitigation would be an integral part of the approval of any APD.

State Appropriative Water Rights: According to NDWR, only about 42.4% of the perennial yield of Railroad Valley groundwater is appropriated. Accordingly, the NDWR has determined that groundwater remains available for new appropriative uses in Railroad Valley Hydrographic Area.

3.2.4.3 Environmental Consequences of Alternative B – Removing parcels that overlap the WMA

Effects on water would be similar to Alternative A – Proposed Action, because the RFD scenario does not change with the number of parcels offered; however, the reduced parcel acreage would further reduce the opportunity for spills to affect surface waters beyond what the protections of the Water Resources CSU stipulation can provide. This is primarily because no oil or gas drilling would take place within the WMA, where the majority of water bodies are located. Likewise, groundwater extraction for oil and gas exploration would be reduced to locations outside of the WMA, thus having less potential to temporarily draw down water levels in the ponded areas. Since groundwater does not observe surface boundaries, the water table could still be lowered with the remaining parcels for lease under Alternative B, but the distance would be greater for the extraction to affect artesian wells or springs and seeps within the WMA. The degree of protection for the parcels still being offered would remain the same because of the Water Resources CSU stipulation where needed, for example for floodplains or playas.

3.2.5 Vegetation and Special Status Plant Species

3.2.5.1 Affected Environment

Vegetation in the Analysis Area provides forage and cover for wildlife and livestock. It also provides ground cover and root mass to stabilize soils and aids in infiltration of water into the ground. The type of vegetation in a particular area depends largely on soil types and average precipitation. The Natural Resource Conservation Service completed soil surveys and has developed ecological site descriptions from the information collected. Each ecological site description provides detailed information regarding vegetative communities and precipitation zones and is used for evaluating land-use potential, potential plant communities and developing reclamation and rehabilitation plans. Vegetative communities in the Analysis Area include Saline Meadows, Saline Bottoms, Sodic Terraces, and Playas. These vegetative communities, as well as BMD Endangered and Threatened or Special Status Species (SSS) plants occurring in BMD, are listed in SI Sections 3 and 6.

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

The disturbance associated with oil and gas exploration and production would add to existing oil and gas development and other overall surface disturbance, including grazing, recreation, mineral exploration, range improvement projects, land development and other projects that use the land. Creating new roads, constructing drill pads, and developing wells and mines removes available vegetation and increases the

susceptibility of soil to wind and water erosion, soil compaction and invasion by invasive species, and disturbs microbiotic crusts and topsoil.

3.2.5.2 Environmental Consequences of Alternative A - Proposed Action

There could be effects to vegetation and special status plant species from future projects on any leased parcels. It is anticipated that most of the exploration is likely to occur in Saline Meadows, Saline Bottoms, Sodic Terraces, and Playas. Removal and crushing of vegetation would increase the amount of bare ground, thus increasing wind and water erosion; and increase the potential for invasion by nonnative and noxious species. Considering the amount of disturbance anticipated in the RFD scenario, the effect on vegetation are expected to be comparatively minor when compared to the areas offered for lease (approximately 10,496.59 acres), and temporary because most of the disturbance (roads and pads) would be reclaimed. Impacts would be considered under additional site-specific analysis when an action is proposed and specifics are known, like location, well depth, water consumption needs, and area of disturbance. Special status plant surveys would be conducted as needed at that time. Through this process, site-specific preventative measures, such as weed prevention, and BMPs, such as cleaning vehicles before and after entering the work area, would be attached as COAs for each proposed activity. Impacts to most vegetation communities are expected to be relatively minor, short term, and localized.

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

3.2.5.3 Environmental Consequences of Alternative B – Removing parcels that overlap the WMA

Effects on vegetation and special status species would be similar to Alternative A – Proposed Action, because the RFD scenario does not change with the number of parcels offered; however, the reduced overall acreage available to oil and gas leasing, exploration, and development will reduce the opportunity for impacts to vegetation or special status plant species within the WMA. The reduction will come from not using existing roads or building drill pads inside the WMA and by moving the activities that could disturb special status species to areas and vegetation to outside the WMA. Effects to vegetation and special status plant species would be considered and addressed during site-specific analysis when an action is proposed.

3.2.6 Noxious Weeds and Invasive, Non-Native Species

3.2.6.1 Affected Environment

The BLM defines noxious weeds, invasive plants, and weeds with different, interrelated definitions (SI Section 7). The BLM's policy relating to the management and coordination of these species is set forth in the BLM Manual 9015 – Integrated Weed Management. The BLM's primary focus is providing adequate capability to detect and treat smaller weed infestations before they have a chance to spread. Noxious weed control is based on a program of prevention, early detection, and rapid response.

Noxious weeds and invasive exotic plants are highly competitive and aggressive, and spread easily. They typically establish and infest disturbed sites, along roadsides and waterways. Invasive exotic and noxious plants are commonly found in Nevada in areas where there are seeps and springs or year-round water;

regardless of whether a site is heavily disturbed, readily available water will increase the likelihood of all plant life including weeds. Wind, water, animals, vehicles/equipment, and humans spread invasive exotic and noxious weeds. Movement of plants from one site to another is greatly increased by introducing humans and equipment to an area. Changes in plant community composition from native species to non-native species can change fire regimes, negatively affect habitat quality, biodiversity, and ecosystem structure and function. The only known infestations of noxious and invasive exotic plants within the Analysis Area is Saltcedar (*Tamarix spp.*), a State of Nevada-designated Category C Noxious Weed, found on parcels 1499 and 6912. The Analysis Area is favorable for infestation by the common invasive plant Saltlover (*Halogeton glomeratus*). Invasive, non-native species also include animals; however, there are no records of invasive, non-native animal species in or near the Analysis Area.

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

3.2.6.2 Environmental Consequences of Alternative A - Proposed Action

There would be no effect on noxious weeds from issuing new oil and gas leases because leasing does not directly authorize oil and gas exploration and development activities, and no ground disturbance would be authorized. The effects that may occur would be an increase of movement of humans and vehicles to, from, and around the proposed parcels, which could slightly expand any disturbed areas within the sites and assist with the movement of noxious and invasive exotic seeds and other plant matter both within the sites and from the sites to other areas, or vice versa. Wind, water, recreation vehicles, livestock and wildlife would also assist with the distribution of weed seed into the newly disturbed areas.

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

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

3.2.6.3 Environmental Consequences of Alternative B – Removing parcels that overlap the WMA

Effects on noxious weeds and invasive, non-native species would be the same as Alternative A – Proposed Action, because the RFD scenario does not change with the number of parcels offered; likewise, noxious

weeds and invasive, non-native species prevention is consistently addressed in project specific analysis when a new action is proposed.

3.2.7 Wildlife Resources

3.2.7.1 Affected Environment

Several wildlife species are likely to occupy the Analysis Area. Parcels with water resources (e.g., streams, springs, seeps, and wet meadows) are likely to support a higher density of wildlife, including endemic aquatic and amphibious species. Other important wildlife habitat types include big sagebrush (mountain and Wyoming big sagebrush), low sagebrush, pinyon-juniper woodlands, and salt desert scrub vegetation. The parcels include seasonally flooded playas; the Great Basin region hosts several rare invertebrate species that occur nowhere else but in this otherwise inhospitable environment. Playas often have the only water available in the desert; pronghorn and other animals may gather there to drink. This section discusses select wildlife species or taxa (groups of species) that are known or likely to occur in the Analysis Area and for which federal law or BLM policy and guidance directs management actions, and includes preliminary scoping input from NDOW and USFWS for this EA. See *SI* Section 6 for an explanation and current list of Nevada BLM Sensitive species in BMD.

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

- Railroad Valley springfish – (*Crenichthys nevadae*) Listed as threatened in May 1986. Railroad Valley Springfish are known to occur on and near Lockes Ranch complex, just west of parcel NV-2022-02-1503, as well as Terrace spring.
- Lockes pyrg – (*Pyrgulopsis lockensis*) The Lockes pyrg was petitioned for listing under the Endangered Species Act (ESA) previously; however, the FWS found that the petition did not present substantial information; therefore, the FWS did not evaluate this species for listing under the ESA.
- Railroad Valley tui chub (*Siphaletes bicolor ssp-7.*) a BLM and Nevada State sensitive species, occurs within Railroad Valley.

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

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

Big Game: The analysis area and all parcels overlap pronghorn (*Antilocapra americana*) year-round habitat (*SI*, Figure 8). No crucial pronghorn winter habitat intersects proposed parcels, but pronghorn are widely distributed across the Analysis Area; fawning can occur anywhere within their distribution depending on yearly habitat conditions, including playas when forage, water or cover is available. Mule deer (*Odocoileus hemionus*) winter range is located east of the lease parcels (*SI*, Section 13 Figures 11, 12) but none of the parcels overlap this habitat. Mule deer use a variety of vegetation types and habitats

seasonally for forage, thermal cover, and escape cover; riparian areas, meadows and aspen stands are important fawn-rearing areas.

Other mammal species of management concern include several BLM Sensitive species (*SI*, Section 6) which may be found in habitats that are widespread in the Analysis Area.

- **Dark and pale kangaroo mouse** (*Microdipodops megacephalus* ssp., *Microdipodops pallidus*) are found in shadscale scrub, sagebrush scrub, and alkali sink plant communities; the former prefers loose sand and gravel, while the latter are nearly restricted to fine sands.

Migratory Birds: A wide variety of bird species protected by the MBTA are found throughout all habitat types in the Analysis Area; see *SI*, Section 5 for a discussion of major avian communities. Riparian vegetation associated with perennial streams, seeps and springs is particularly important for a diverse migratory bird community. The WMA provides important wetland habitat for waterfowl and shorebird species. Playas, if consistently flooded during the breeding season, may provide breeding habitat for the sensitive western snowy plover (*Charadrius nivosus*); and pooled waters from occasional flooding could provide feeding and stopover habitat for migrating shorebirds. The Yellow-billed Cuckoo (*Coccyzus americanus*) was recently documented in the Lockes area. The western distinct population segment of the yellow-billed cuckoo is listed as threatened under the ESA and is state protected and further classified as sensitive.

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

3.2.7.2 Environmental Consequences of Alternative A - Proposed Action

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

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

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

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

The 10 lease parcels identified within the Tonopah Field Office Resource Management Area are located outside designated Greater Sage-grouse (GRSG) Priority and General Habitat Management Areas (PHMA & GHMA) and do not pose a threat to this species. However, future exploration or development proposals that fall within 6 kilometers of GRSG habitat are required to consult with the State of Nevada Sagebrush Ecosystem Technical Team.

In addition to TL stipulations for wildlife, the Water Resources CSU stipulation is attached to parcels that intersect perennial water, springs, wetland or riparian areas, playas, floodplain, or wells. The Water Resources stipulation notifies the lessee of water resources on the parcel. The NSO stipulation has been applied to all parcels that overlap with the WMA. Aquatic invertebrates and amphibians of conservation concern whose presence cannot be confirmed due to incomplete survey data will be identified and further protected during future parcel disturbance proposals and NEPA analysis. Stipulations cannot be attached to a parcel to protect resources that are off-parcel; however, off-parcel resources, such as aquatic and amphibious species would be identified during project specific site inspections, NDOW and USFWS would be consulted, and potential effects would be identified and mitigated or avoided at that time.

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

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

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

3.2.7.3 Environmental Consequences of Alternative B – Removing parcels that overlap the WMA

Effects to wildlife resources would be similar to Alternative A – Proposed Action, because the RFD scenario does not change with the number of parcels offered; however, the reduced parcel acreage would further reduce the opportunity for disturbance from oil and gas drilling to affect those wildlife resources in the WMA. This is primarily because no oil or gas drilling would take place within the WMA, where the majority of water bodies and riparian areas are located, which draw wildlife, migratory birds, and a host of special status species. The degree of protection for the parcels still being offered would remain the same because of the stipulations mentioned above, but overall effects would be reduced.

3.2.8 Grazing Management

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

3.2.8.1 Affected Environment

Three grazing allotments include all or portions of the parcels proposed for leasing (*Figure 13, SI, Section 13*). Table 14 shows the allotments within the Analysis Area, the public acres within the allotment, the number of acres of offered lease parcels within each allotment, the number of authorizations (permittees) within each allotment, the kind of livestock authorized, and active and suspended AUMs. Boundary grazing allotments may be managed by the adjacent District.

Table 15. Grazing allotments with proposed lease parcels for February 2022 lease sale.

Allotment Name	Allotment Public Acres	Approximate Lease Parcel Acres	Number of Authorizations	Kind	AUMs	Suspended AUMs
Blue Eagle	44,330	597	1	Cattle	2,026	0
Butterfield	120,474	10,805	1	Cattle	4,776	470
Nyala	326,220	1,718	1	Cattle	13,255	6,742

The disturbance associated with oil and gas exploration and production would add to the disturbances from mining activities and off-highway vehicle use. Creating new roads, constructing drill pads and developing wells and mines removes available forage, which could affect ranching operations. However, based on the RFD scenario (*SI, Section 9*), the effects of the proposed action and similar actions on rangeland resources are expected to be minimal due to the relatively small area of disturbance, concurrent reclamation and site-specific mitigation.

3.2.8.2 Environmental Consequences of Alternative A - Proposed Action

Potential future actions on leased parcels under the RFD scenario would decrease the public land acreage available for livestock grazing minimally, with potential to temporarily decrease the active AUMs in the affected allotment(s). Currently, available forage is allocated on public land at the allotment scale within the District. According to 43 CFR 4110.4-2 (a)(1), where there is a decrease in public land acreage available for livestock grazing within an allotment, grazing permits may be modified as appropriate to reflect the changed area of use. The established stocking rates (AUMs/Acre) will potentially be used to temporarily reduce the appropriate amount of AUMs within allotments based on the number of acres affected by future actions on leased parcels under the RFD scenario. However, the effects are expected to be minor when compared to the total acreage of the grazing allotment(s) that may be affected; and would be temporary in nature, because the majority of the disturbance (roads and pads) would be reclaimed. Impacts to rangeland resources from these activities would be analyzed under an additional project specific EA when an action is proposed and specifics are known, such as location, well depth, water

consumption needs, and area of disturbance. Through this process, project-specific mitigation measures and BMPs would be attached as COAs for each proposed activity. Any potential effect to existing range improvements would also be identified and mitigated via the project-specific analysis for any future exploration or development project on leased parcels.

3.2.8.3 *Environmental Consequences of Alternative B – Removing parcels that overlap the WMA*

Effects on grazing management would be the same as Alternative A – Proposed Action, because the RFD scenario does not change with the number of parcels offered; further, the WMA *excludes cattle grazing*. Grazing allotment changes are addressed in project specific NEPA analysis when a new action is proposed and are not likely to be adversely affected by Alternative B.

3.2.9 Cultural Resources

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

3.2.9.1 *Affected Environment*

Parcels are located primarily in areas of little prior cultural resource survey. Although limited cultural resource surveys have been completed within the proposed parcels (less than 10% of the total parcel acreage has been surveyed at the Class III level) all are likely to contain areas of moderate and/or high sensitivity for cultural resources.

Two parcels (NV-2022-02-6910 and NV-2022-02-6912) are located within the Trap Springs-Gravel Bar Archaeological Complex which encompasses 8,480 acres. This complex has been identified in the RMP as an area that will be Managed for Information Potential to maximize data recovery and salvage of cultural resources, while allowing for oil and gas production. Current management includes restricting vehicular use to existing roads and trails, closure of the Gravel Bar Road, and closing 679 acres identified as The Gravel Bar to mineral materials disposal.

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

3.2.9.2 *Environmental Consequences of Alternative A - Proposed Action*

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

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

The Standard Lease Notice, NV-B-00-A-LN, would be attached to all leases within the BMD to help minimize any potential effects on cultural resources located within the proposed parcels. This Lease Notice informs the lessee that their lease may contain historic properties and/or resources protected under the NHPA, American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, Executive Order 13007, or other statutes and executive orders. It also informs the lessee that the BLM will not approve any ground-disturbing activities that may affect any such properties or resources until it completes its obligations (e.g., State Historic Preservation Officer [SHPO] and tribal consultation) under applicable requirements of the NHPA and other authorities. The BLM may also require modification to exploration or development proposals to protect such properties or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized, or mitigated.

3.2.9.3 Environmental Consequences of Alternative B – Removing parcels that overlap the WMA

Effects on cultural resources would be the same as Alternative A – Proposed Action, because the RFD scenario does not change with the number of parcels offered.

3.2.10 Native American Cultural and Religious Concerns

3.2.10.1 Affected Environment

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

Tribal ethnographic resources are associated with the cultural practices, beliefs, and traditional history of a community. In general, ethnographic resources include places in oral histories or traditional places, such as particular rock formations, water sources, or a rock cairn; large areas, such as landscapes and viewsheds; sacred sites and places used for religious practices; social or traditional gathering areas, such as racing grounds; natural resources, such as plant materials or clay deposits used for arts, crafts, or ceremonies; and places and natural resources traditionally used for non-ceremonial uses, such as trails or camping locations. Future Native American consultations in the area may reveal such sites, activities, or resources.

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

Fluid mineral leasing and exploration may affect sites and associated activities of a cultural, traditional and spiritual nature. Potential residual effects of any surface occupancy that results from oil and gas leasing may be cumulative with other past, present, and future actions. Presently, effects to many cultural, traditional, spiritual sites and associated activities have been 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 also provide affected tribes an opportunity to comment and consult on proposed actions.

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

Tribal Consultation and Information Sharing: The BLM BMD have an ongoing invitation for consultation and information sharing with the tribes. Consultation and communication with these tribal/band governments have included letters, phone calls, e-mails, and visits with individual tribal/band Environmental Coordinators or other representatives. Consultation and information sharing will continue throughout the life of the project. The majority of lands in the Analysis Area have not been analyzed for ethnographic resources or Native American cultural concerns. The BLM contacted the Duckwater Shoshone, Ely Shoshone, Timbisha Shoshone, and Yomba Shoshone Tribes to identify areas of concern, mitigation measures, operating procedures or alternatives that may eliminate or reduce impacts to any existing tribal resources.

3.2.10.2 Environmental Consequences of Alternative A - Proposed Action

Although the act of issuing oil and gas leases does not directly authorize exploration, development, or production, or any other related ground-disturbing activities, the potential exists for future such activities on leased parcels to affect Native American spiritual, cultural, or traditional sites. Such effects can be difficult to effectively mitigate; however, effects can be minimized and/or mitigated when affected Tribes provide input and actively and fully participate in the decision-making process. The Standard Lease Notice, NV-B-00-A-LN, is attached to all parcels and states that BLM will not approve any ground-disturbing activities until it conducts its tribal consultation obligations, and may require modification to exploration or development proposals or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized, or mitigated. If projects are proposed on any leased parcel in the future, each would be analyzed under project specific NEPA analysis. At that time the BLM would consult with the tribes and site-specific mitigation measures and BMPs would be attached as COAs.

3.2.10.3 Environmental Consequences of Alternative B – Removing parcels that overlap the WMA

Effects on Native American Cultural and Religious Concerns would be the same as Alternative A – Proposed Action, because the RFD scenario does not change with the number of parcels offered.

3.2.11 Recreation

3.2.11.1 Affected Environment

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

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

3.2.11.2 Environmental Consequences of Alternative A - Proposed Action

Lease parcels that fall within the Railroad Valley WMA are limited to existing roads and trails, and fluid mineral leasing is subject to controlled surface use stipulation (NV-B-09-B-CSU). Future activity on leased parcels could affect recreation resources. During the exploration phase, survey and drilling crews are likely to use available access roads and trails that are also used for dispersed recreation and access to recreation opportunities. Increased truck traffic during construction of access roads and well pads could affect recreation due to increased noise and dust levels and could cause temporary delays or closures on access roads. Construction sites are likely to limit public access, slightly decreasing access to the area for recreation and possibly displacing recreational users. Survey and exploration activities are likely to minimally effect recreation, if at all, due to the short duration, small crew size and temporary nature of the surveys and well drilling, along with the dispersed nature of recreation activities in these areas.

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

3.2.11.3 Environmental Consequences of Alternative B – Removing parcels that overlap the WMA

Effects on recreation resources would be the same as Alternative A – Proposed Action, because the RFD scenario does not change with the number of parcels offered; however, by not offering parcels that overlap the WMA, recreation resources are not being shared with oil and gas exploration on existing roads and trails, and noise and lights from exploration would be further removed for recreationist within the WMA. However, existing oil and gas leases could still be developed, with additional NEPA analysis needed, including effects to recreation resources.

3.2.12 Visual Resources

3.2.12.1 Affected Environment

BLM Manual Series 8400 outlines the visual resource management (VRM) program. The BLM assigns VRM classes to public lands through the land use planning process, with management direction for each class. Attempts are made to mitigate visual contrasts from surface-disturbing activities regardless of the

VRM class. VRM classes are based in part on a Visual Resources Inventory (VRI) which rates existing scenic values.

All of the proposed lease parcels in the TFO area are in VRI Class IV except where they fall within the WMA mentioned above in Section 2.2 (Figure 15, *SI*, Section 13). If and when a project is proposed, effects to visual resources, and measures to minimize them, would be considered as part of the additional project specific environmental analysis. As stated above, a VRM class will be established for each project. Effects would be assessed from key observation points, such as roads, scenic overlooks, or homes. Structures in the foreground distance zone (0-½ mile) often create a contrast that exceeds the VRM class, even when designed to harmonize and blend with the characteristic landscape. Approval by the Area Manager is required on a case-by-case basis to determine whether the structure(s) meet the acceptable VRM class standards and, if not, whether they add acceptable visual variety to the landscape. Dark skies are also taken into consideration as a visual resource. Central Nevada, including the Analysis Area, generally offers outstanding night sky viewing opportunities with frequent clear weather and many areas of little or no light pollution.

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

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

3.2.12.2 Environmental Consequences of Alternative A - Proposed Action

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

- designing lighting to reduce the impacts to night skies
- screening any stationary lights and light plants
- directing lighting onto the pertinent site only and away from adjacent areas not in use, with safety and proper lighting of the active work areas being the primary goal
- hooding and shielding lighting fixtures as appropriate
- using topographic features to visually screen facilities
- locating drill sites where they will be least conspicuous (BLM has the discretion to move proposed drill site locations up to 200 meters within the lease boundary)
- reducing the size or changing the configuration of drill pads
- using low profile tanks
- matching colors (approved by BLM VRM specialist) of facilities and equipment to blend in with the surroundings
- planning road alignment to minimize visual contrast

- required reclamation, which may include re-contouring drill pads; reclaiming roads; re-seeding drill sites and roads; and removing equipment and facilities

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

3.2.12.3 Environmental Consequences of Alternative B – Removing parcels that overlap the WMA

Effects on visual resources would be the same as Alternative A – Proposed Action, because the RFD scenario does not change with the number of parcels offered. The degree of protection for those parcels still being offered would remain the same. Further NEPA analysis would take place at the project stage on a case-by-case basis and effects would be assessed from key observation points, as described above, to minimize impacts to visual resources.

3.2.13 Geology and Mineral Resources

3.2.13.1 Affected Environment

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

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

Locatable Minerals 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 Material Sale of common minerals encompasses petrified wood and common varieties of sand, stone, gravel, pumice, pumicite, cinder, and clay. Less common are sales of topsoil and specialty sand, gravel, or decorative rock. Saleable mineral sites with a priority for use are located along State, County, and BLM managed roads. These types of saleable minerals are distributed throughout Nevada and overlap with oil and gas lease parcels should be expected. Parcels that overlap existing mineral material sale permits are listed in lease notice, NV-B-12-A-LN and NV-B-12-B-LN.

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

Oil and Gas parcels on public lands have been available within the District for several decades. The main producing oil fields are located within Railroad Valley and Pine Valley; however, exploration for oil and gas could be expected in Diamond Valley, Garden Valley, Big Smoky Valley, Ione Valley, Fish Creek

Valley, Antelope Valley, and Big Sand Springs Valley. Oil and gas in Railroad Valley occur mainly in Miocene and younger age basins formed during the Basin and Range Orogeny. Hydrocarbon traps are stratigraphic and structural in nature. Most oil and/or gas are trapped in the fractured, Oligocene age volcanic rocks and are believed to be sourced from deeper Cretaceous and early Tertiary marine sediments. Pine Valley oil production comes primarily from Oligocene and Miocene sedimentary and volcanoclastic sedimentary rocks, but rocks as old as the Devonian Telegraph Canyon Formation host oil in the vicinity of the Analysis Area. Natural gas is not produced in commercial quantities in Nevada.

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

As of July 7, 2021, there are 488 authorized oil and gas leases in Nevada (Nevada Division of Minerals (NDOM)). Since 1907, roughly 770 oil and gas wells had been drilled in Nevada. Total oil production from 1955 to 2019 is 54 million barrels of oil. Oil production in 2015-2019 averaged 266,872 barrels of oil per year (source: NDOM).

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

Geothermal – All land within the BMD is open to geothermal leasing and development with the exception of specific closures such as Wilderness Areas, Wilderness Study Areas, community watersheds, critical wildlife habitat areas, and military reservations; 20 percent of the land within the District is potentially valuable for geothermal resources, located mainly in Esmeralda and Lander counties. The 2008 *Geothermal Programmatic Environmental Impact Statement for Geothermal Leasing in the Western U.S.* expedites processing geothermal lease applications. There are no geothermal leases overlapping lease sale parcels.

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

3.2.13.2 Environmental Consequences of Alternative A - Proposed Action

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

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

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

3.2.13.3 Environmental Consequences of Alternative B – Removing parcels that overlap the WMA

Effects on geology and mineral resources would be the same as Alternative A – Proposed Action, because the RFD scenario does not change with the number of parcels offered. A number of active oil and gas leases overlap the WMA boundary (Table 16).

Table 16. Table of Authorized Leases that overlap the WMA boundary

Serial Number	Case Acres	Case Established	Case Expires
NVN 41242	400.00	3/23/1984	Held by Production
NVN 41245	320.28	3/23/1984	Held by Production
NVN 42341	2801.60	11/30/1953	Held by Production
NVN 45253	440.00	3/19/1974	Held by Production
NVN 50925	720.00	8/14/1985	Held by Production
NVN 96805	320.00	8/3/2018	2028
NVN 98477	1909.29	10/25/2019	2029
NVN 98478	1907.98	10/25/2019	2029
NVN 98485	673.44	10/25/2019	2029
NVN 98874	1920.18	11/1/2019	2030
NVN 98875	1280.00	2/10/2020	2030
NVN 98885	1000.00	2/10/2020	2030
NVN 99443	1907.98	10/25/2019	2029

Authorized leases held by production would continue to remain in existence. New development on existing authorized oil and gas leases not held by production would be subject to additional NEPA analysis at the project proposal stage.

3.2.14 Land Use Authorizations

3.2.14.1 Affected Environment

All of the proposed lease parcels are on public lands with federally controlled surface and subsurface mineral estate. Many would require a right-of-way (ROW) to access them. Some proposed parcels include pre-existing land use authorizations such as grants, leases, permits and withdrawals; and new ones may be authorized prior to any proposals for exploration by an oil and gas lessee. In these instances, the holder of land use authorization would have a valid existing right to the authorized use of public lands within the

lease. SI Section 10 provides a summary of the existing land use authorizations on the proposed lease parcels by case file number and including affected lease parcels. A map is provided in SI, Section 13.

Based on the RFD scenario, only a small percentage of acres of constructed roads associated with exploration/development would potentially remain after 10 years. The likelihood of other resources being present at the same location is minor, although not impossible, and methods are in place to co-develop resources.

3.2.14.2 Environmental Consequences of Alternative A - Proposed Action

Future activity on leased parcels could affect existing ROWs. FLPMA requires that prior existing rights must be recognized. Any conflicts would be mitigated through agreements between relevant operators. If parcels were developed in the future, site-specific mitigation measures and BMPs would be attached as COAs for each proposed activity. Applications for new ROWs may be required for roads for oil and gas exploration and production activities. These off-lease ROWs would be non-exclusive where possible, that is, could be used by the general public for other purposes such as access to public lands.

3.2.14.3 Environmental Consequences of Alternative B – Removing parcels that overlap the WMA

Effects on land use authorization would be the same as Alternative A – Proposed Action, because the RFD scenario does not change with the number of parcels offered. Existing leases would be subject to additional NEPA analysis when a new project is proposed.

3.2.15 Socioeconomic Values and Environmental Justice

3.2.15.1 Affected Environment

Socioeconomics

All the proposed lease parcels are located within northern Nye County. Data were obtained from the U.S. Department of Labor, the Bureau of Labor Statistics, local area unemployment statistics, the U.S. Department of Commerce, and the Census Bureau, as compiled by the Headwaters Economics Socioeconomic Profiles Tool developed for the BLM.

As of the 2019 U.S. census the average population density in Nye County is 2.4 persons per square mile (Table 16).

Table 17. Population density by county.

County	Area, mile²	Population, 2019 census	Population density per mile²
Nye	18,199	44,380	2.4
(Nevada)	(110,572)	(2,972,382)	(26.9)

Population centers for Nye County include Pahrump, Tonopah, and Beatty with significantly differing populations. Census tract data is more applicable for this analysis, which divides Nye County into multiple parts. Socioeconomic (SE) data are typically available at the county level; however, census tract boundaries are used to define the SE study area in this case, these include census tracts 9601 and 9602 combined, which provide a better estimate of population in this region of Nye County.

Table 18. Population density for census tracts.

Area	Area, mile²	Population, 2019 census	Population density per mile²
Northern Nye¹	~11,700	4,677	0.4
Nye County	18,199	44,380	2.4

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

Jobs by Industry

In 2019, there were approximately 1,957 total jobs in non-services industries in the study area. In the same year there were around 507 jobs in service-related industries. The majority of civilian employees in northern Nye County are employed in sales and office; service; management (professional and related); production and transportation; construction, extraction, maintenance, and repair. The industries employing this workforce are mining (gold), agriculture (cattle and sheep ranching and alfalfa hay farming), fishing and hunting, or forestry, retail trade, arts, entertainment, recreation, accommodation, or foods.

Population, Employment, and Income

The total population in the study area was 4,677 in 2019, representing an increase of -20.5% from 2000 to 2019. The number of employed workers in the study area in 2019 was 3,420. In 2019, the average annual unemployment rate was 19.2 percent. In 2019, 96.8 percent of workers aged 16 and over within the study area worked in their county of residence. Per capita income in the study area in 2019 was \$31,395 and the median household income was \$50,018 (2019 dollars). The highest paying industry is mining.

Poverty, Minorities, and Other Demographic Indicators

In 2019, the total number of people living in poverty, as defined by the U.S. Census Bureau, was 434, or 9.7 percent of the population. In the same year, there were 91 families living in poverty, or 8.8 percent of all families. Out of all persons living within the study area in 2019, 1,476 or 31.5 percent, self-identified as being a member of a minority group. Of those, 415, or 8.9 percent of the total population, self-identified as Native Americans and 383 identify as American Indian. The mean median age within the study area in 2019 was 44.2 years. The total number of housing units was 3,183 of which 73.3 percent were occupied and 12.5 percent were seasonal, recreational, or occasionally occupied properties. Of those living within the study area aged 25 or older, 92.3 percent had graduated from high school and 8.5 percent had earned a bachelor's degree or higher in 2018.

Environmental Justice

“Environmental justice” is an initiative that culminated with President Clinton’s February 11, 1994, Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” and an accompanying Presidential memorandum. The Executive order requires that each federal agency consider environmental justice to be part of its mission. Its intent is to promote fair treatment of people of all races and income levels, so no person or group of people bears a disproportionate share of the negative effects from the country’s domestic and foreign programs. Specific to the EIS process, the Executive order requires that proposed projects be evaluated for “disproportionately high adverse human health and environmental effects on minority populations and low-income populations.”

The Environmental Protection Agency (EPA) guidelines for evaluating the potential environmental effects of projects require specific identification of minority populations when either: (1) a minority or low-income population exceeds 50 percent of the population of the affected area; (2) a minority or low-income population represents a meaningfully greater increment of the affected population than of the population of some other appropriate geographic unit, as a whole (the BLM typically uses 10 percentage points higher than the state population percentage for this measure); or (3) concentrated populations of American Indians.

Within the study area, and American Indian population is present in one or more Census Blockgroups, based on analyses completed using the EPA's EJScreen web mapping tool (*SI* Section 11).

3.2.15.2 Environmental Consequences of Alternative A - Proposed Action

Socioeconomic Values

The only direct effect of issuing new oil and gas leases on socioeconomic values within the Analysis Area would be generation of revenue from the lease sale, as the State of Nevada retains 49 percent of the proceeds. Revenues generated from both competitive and non-competitive oil and gas lease sales in the state of Nevada for fiscal year 2018 totaled \$3.1 million; statewide revenues from 2014 to 2018 totaled \$23.9 million (ONRR, 2018). Subsequent oil and gas exploration, development and production could affect the local economy in terms of additional jobs, income and tax revenues. Oil and gas companies typically provide in-house scientists and technicians for most pre-drilling exploration work. Subsequent oil and gas exploration and development activities could include road and drill pad construction, which could be contracted to local contractors. Wells would typically be drilled over a period of time and not at the same time. Since these parcels fall near producing fields, it is unlikely that a large number of jobs would be created and because there are few developments in Railroad Valley to support work crews, companies exploring for or developing oil and gas leases often bring workers to the site, where they live in company or personally owned mobile housing units until the work is complete. The local communities of Eureka, Tonopah, or Ely could see some benefit during construction. These could include consumables such as fuel or food; additionally, waste storage and pickup services may be retained at these locations.

During development and production phases, the potential for local socioeconomic impacts could increase. More long-term roads and drill pads could be constructed, along with associated support facilities. Typically, most of this work is supplied by local contractors. Local businesses may realize increased revenue from the purchase of supplies, meals, rooms, etc. Local trucking and delivery companies may also benefit economically by transporting supplies, building materials and oil products. Oil production from federal lands is subject to a 12.5 percent royalty payment to the federal government. Half of that amount is provided to the state government, which then provides a portion to the counties.

Positive indirect impacts to socioeconomics would likely be minor, given the RFD scenario (*SI* Section 9); however, bonus bids (the amount paid at time of auction), annual rent fees (for 10 years regardless of activity on a leased parcel), and royalties (if and when production occurs) may provide substantial income to county governments for schools and other expenditures. The potential for adverse effects to the human environment, including human health hazards, is considered to be low (see effects analyses for air quality, section 3.2.1.2; water quality, 3.2.4.2; and hazardous and solid waste, 3.2.16.2). The Proposed Action would not induce substantial growth or concentration of population, displace a large number of people, cause a substantial reduction in employment, reduce wage and salary earnings, cause a substantial net increase in county expenditures, or create a substantial demand for public services.

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

Environmental Justice

Because an American Indian population is known to exist within the county included in the study area, future site development and production on leased parcels will require an additional Environmental Justice assessment to assess and evaluate potential disproportionate adverse effects to EJ population(s) present in the project area.

3.2.15.3 Environmental Consequences of Alternative B – Removing parcels that overlap the WMA

Effects on Socioeconomic Values and Environmental Justice would be similar to Alternative A – Proposed Action; however, the direct effect of issuing leases and those revenues and proceeds from the sale of the parcels would be reduced by half because half of the parcels would not be offered. Based on the RFD Scenario, *SI* Section 9, the number of wells expected to be developed over a ten-year period is not influenced by the number of parcels offered, so effects of not leasing these parcels under Alternative B does not change. The existing, prior leases (see 3.2.13.3) could be developed, though additional, project- and site-specific NEPA analysis would include effects to socioeconomic values and environmental justice for the proposal.

3.2.16 Waste, Hazardous and Solid

3.2.16.1 Affected Environment

The majority of the proposed lease parcels is within the rural area of Railroad Valley, not adjacent to any schools or populated centers. The area is sparsely populated with individual ranches and agriculture facilities (alfalfa). The parcels are proximal to the small community of Currant and the Duckwater Shoshone Tribe. The most prominent feature is oil and gas extraction and refinery operations in the valley. The analysis area is not near activities generating hazardous or solid waste such as mining exploration or extraction operations. Although there is recent interest in soluble lithium, the type of extraction is expected to be smaller than oil and gas exploration using similar equipment and generating similar waste types as one expects from oil and gas or water well drilling.

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

3.2.16.2 Environmental Consequences of Alternative A - Proposed Action

Under Alternative A, the BLM would offer for lease all or part of the nominated parcels (covering approximately 10,497 acres) in the lease sale. The act of selling oil and gas leases in itself does not have the potential to cause environmental effects from hazardous materials, hazardous waste, or solid waste. Lease sales do not authorize exploration, development, or production that could directly affect the environment; however, once issued, a lease bestows upon its owner the “right to use so much of the lease lands as is necessary to explore for, drill for, mine, extract, remove and dispose of the leased resource in the leasehold” (43 CFR§ 3101.1-2) subject to specific nondiscretionary statutes and lease stipulations.

Oil and gas activities including exploration drilling, extraction, production facilities, pipeline transport, and tanker loading, unloading and transport, have the potential to affect the environment through production of waste fluids and emissions resulting from field development and related infrastructure. Oil 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 1.6) and Gold Book standards, guidelines and BMPs would be applied.

The RFD scenario predicts that approximately 25 exploration wells would be drilled and few, if any, would continue into development and production phases. Environmental effects from hazardous materials, hazardous waste, and solid waste which might be encountered during each phase are provided below. However, most of these incidental effects, if not all, can be avoided or lessened through proper inspection and maintenance.

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

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

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

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

When the RFD scenario is considered, effects to human health would generally be negligible because the substances involved would be properly handled, stored, and disposed of in accordance with applicable federal, state and local regulations. Proper management of these substances would ensure that no soil, ground water, or surface water contamination would occur with any adverse effect on wildlife, worker health and safety, or surrounding communities. Additional project- and site-specific environmental analysis of any future exploration, development and/or production would allow inclusion of updated mitigation measures, BMPs, and COAs; and performance standards would be defined at that time.

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

3.2.16.3 Environmental Consequences of Alternative B – Removing parcels that overlap the WMA

Alternative B removes parcel land that is located within the Railroad Valley WMA. Removing the parcel lands within the Lockes Pond, the Big Well, and Blue Eagle portions of the WMA would reduce the parcels available for oil and gas leasing from ten (10) to five (5) parcels. Under this alternative, approximately 7,936.59 acres would not be subject to the potential effects of any accidental hazardous waste spillage described for the Proposed Action. The remaining 2,560 acres (5 parcels) that would be offered for lease sale under this alternative would be subject to the same potential effects as described for the Proposed Action.

Chapter 4. List of Preparers

An ID Team prepared the document and analyzed the effects of the proposed action and alternatives upon the various resources (Table 19). They considered the affected environment and documented the effects to resources in the body of the EA.

Table 19. List of specialists

Resources	Specialists
Air Quality, Greenhouse Gas, and Climate Change	Franklin Giles, Rebecca Moore
Water Resources	Thomas Gibbons
Soils, Vegetation, Rangeland Resources	Thomas Mendoza
Noxious Weeds, Invasive Non-native Species	Thomas Mendoza
Wildlife Resources and Special Status Species	Brandon Crosby
Cultural Resources and Paleontology	Cassandra Albush
Native American Cultural and Religious Concerns	Wilfred Nabahe
Recreation, Visual Resources, Wilderness Characteristics	Ashley King
Geology and Minerals	Melissa Jennings
Land Use Authorizations	Wendy Seley
Socioeconomics and Environmental Justice	Melissa Jennings
Waste, Hazardous and Solid	Kristin Reid
NEPA compliance	Melissa Jennings

Chapter 5. References

- BLM. (1994). *Tonopah Environmental Impact Statement and Proposed Resource Management Plan*. Tonopah, NV: Department of Interior.
- BLM. (1997, October). Approved Tonopah Resource Management Plan and Record of Decision. Tonopah, NV: United States Department of the Interior, Bureau of Land Management.
- BLM. (2007, September). Final Vegetation Treatments Using Herbicides Programmatic Environmental Impact Statement and Record of Decision. Washington, D.C. Retrieved from <https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage¤tPageId=103592>
- BLM. (2008). *Bureau of Land Management National Environmental Policy Act Handbook*. Department of Interior.
- BLM. (2020). *Oil and Gas Statistics*. Retrieved from <https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/oil-and-gas-statistics>
- BLM. (2021). *BLM Specialist Report on Annual Greenhouse Gas Emissions from Coal, Oil, and Gas Exploration and Development on Public Lands and the Federal Mineral Estate*. Bureau of Land Management. doi:<https://www.co.blm.gov/AirResourcesReport/ghg/>
- BLM, USGS, USFS, DOE, and EIA. (2008). *Inventory of Onshore Federal Oil and Natural Gas Resources and Restrictions to Their Development. Phase III Inventory. BLM/WO/GI-03/0002+3100/REV08. Prepared by the U.S. Departments of the Interior, Agriculture, and Energy*. Retrieved from https://www.blm.gov/sites/blm.gov/files/EPCA_III_Inventory_Onshore_Federal_Oil_Gas.pdf
- Erbes, R.E. (2013). *Air Emissions Inventory Estimates for a Representative Oil and Gas Well in the Western United States*. Littleton: Kleinfelder West, Inc. Retrieved 09 17, 2021, from https://climatewest.files.wordpress.com/2015/03/blm_oandg_rpt_final_032613_21.pdf
- FEMA. (2015). *Guidelines for Implementing Executive Order 11988 and Executive Order 13690*. Retrieved 09 17, 2021, from <https://www.federalregister.gov/documents/2015/10/22/2015-26839/guidelines-for-implementing-executive-order-11988-floodplain-management-and-executive-order-13690>.
- FEMA. (2015). *National Flood Insurance Fact Sheet for Stakeholders: Understanding Zone D for Levees: "Areas of Undetermined Flood Hazards"*. Retrieved 09 17, 2021, from <https://www.fema.gov/media-library/assets/documents/22741>
- IMPLAN. (2020, May). MIG IMPLAN (IMpacts for PLANning).
- IPCC. (2014). *IPCC Fifth Assessment Report, Chapter 8 Anthropogenic and Natural Radiative Forcing*. Retrieved from https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter08_FINAL.pdf

- Nevada Division of Minerals (NDOM). (n.d.). Oil Production in Nevada by Producing Fields 1954 to 2019 (in Barrels). Retrieved 10 05, 2021, from <https://minerals.nv.gov/Programs/OG/OG/>
- Nevada Division of Water Resources (NDWR). (2020). Basin Evapotranspiration. Retrieved 09 17, 2021, from <http://water.nv.gov/EvapotranspirationBasinSummary.aspx>
- NOAA/ESRL. (2020, 1 7). *Trends in Atmospheric Greenhouse Gases*. Retrieved from <https://www.esrl.noaa.gov/gmd/ccgg/trends/data.html>
- ONRR. (2020). Office of Natural Resources Revenue (ONRR). (D. o. Interior, Ed.) doi:<https://www.onrr.gov/>
- U.S. Department of Commerce. (1982). Mean Monthly, Seasonal, and Annual Pan Evaporation for the United States. *NOAA Technical Report NWS 34*. Washington, D.C. Retrieved 09 17, 2021, from <https://www.ncdc.noaa.gov/>
- U.S. Department of Commerce. (2017). Headwaters Economics Profile Tool. (C. Bureau, Ed.) American Community Survey Office. Retrieved 09 17, 2021, from <https://headwaterseconomics.org/tools/blm-profiles/>
- U.S. Energy Information Administration (EIA). (2020, 1 23). *State Carbon Dioxide Emissions Data*. Retrieved from <https://www.eia.gov/environment/emissions/state/>
- U.S. Energy Information Administration (EIA). (2021, 9 27). *International Energy Outlook 2021*. Retrieved from <https://www.eia.gov/outlooks/aeo/>
- U.S. Energy Information Administration (EIA). (n.d.). Supply disruptions and rising demand boosted East Coast petroleum product imports in March. Retrieved from <https://www.eia.gov/todayinenergy/detail.php?id=48316>
- U.S. Environmental Protection Agency (EPA). (2016). *Hydraulic Fracturing for Oil and Gas: Impacts from the Hydraulic Fracturing Water Cycle on Drinking Resources in the United States*.
- U.S. Environmental Protection Agency (EPA). (2018). Facility Level Information on GreenHouse Gases Tool (FLIGHT). Retrieved from <https://ghgdata.epa.gov/ghgp/main.do>
- U.S. Environmental Protection Agency (EPA). (2019). *Greenhouse Gases Equivalencies Calculator - Calculations and References*. Retrieved from <https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references>
- U.S. Environmental Protection Agency (EPA). (2021, 4 14). *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2019*. Retrieved from <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2019>
- U.S. Environmental Protection Agency (EPA). (n.d.). Environmental Justice Screening and Mapping Tool. Retrieved October 2021, from <http://www.epa.gov/ejscreen>

- US DOI and USDA. (2007). Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development. BLM/WO/ST-06/021+307/REV 07. Denver, Colorado: Bureau of Land Management.
- USGCRP. (2018). *Impacts, Risks, and Adaptation in the United States: Fourth National Climate [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Washington, DC, USA: U.S. Global Change Research Program.*
- USGS. (2018). *Federal lands greenhouse emissions and sequestration in the United States—Estimates for 2005–14: Merrill, M.D., Sleeter, B.M., Freeman, P.A., Liu, J., Warwick, P.D., and Reed, B.C.*
- Western Regional Climate Center. (1978-2016). Period of Record Monthly Climate Summary for Blue Eagle weather station (260955). Blue Eagle, Nevada. Retrieved 09 22, 2021, from <https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?nv0955>