

PRELIMINARY ENVIRONMENTAL ASSESSMENT DOI-BLM-NV-W010-2014-0013-EA

September 2014 Competitive Oil and Gas Lease Sale

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Prepared by:

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It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

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LIST OF ACRONYMS

af/year	acre-foot per year
AQRV	air quality related values
AIRFA	American Indian Religious Freedom Act
APD	Application for Permit to Drill
ARPA	Archaeological Resources Protection Act
AHPA	Archaeological and Historic Preservation Act
BMPs	best management practices
BLM	Bureau of Land Management
CH ₄	methane
CO ₂	carbon dioxide
CO	carbon monoxide
CAA	Clean Air Act
CWA	Clean Water Act
CFR	Code of Federal Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEQ	Council on Environmental Quality
CESA	Cumulative Effects Study Area
DD	Department of Defense
ESA	Endangered Species Act
EA	Environmental Assessment
EO	Executive Order
EPA	United States Environmental Protection Agency
FLPMA	Federal Land Policy and Management Act
ft bgs	feet below ground surface
FONSI	Finding of No Significant Impact
GHGs	Greenhouse gases
HAPs	hazardous air pollutants
HA	Herd Area
HMA	Herd Management Area
HF	hydraulic fracturing
IPaC	Information, Planning and Conservation System
IM	Instruction Memorandum
kV	kilo-volt
LCT	Lahontan cutthroat trout
LR2000	Legacy Rehost System
MFP	Management Framework Plan
MOU	Memorandum of Understanding
MTBA	Migratory Bird Treaty Act
MLA	Mineral Leasing Act
NAAQS	national ambient air quality standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NHD	National Hydrographic Dataset

NRHP	National Register of Historic Places
NDOM	Nevada Division of Minerals
NDOW	Nevada Department of Wildlife
NDEP	Nevada Division of Environmental Protection
NDWR	Nevada Division of Water Resources
NNHP	Nevada Natural Heritage Program
NO ₂	nitrogen dioxide
N ₂ O	nitrous oxide
NOI	Notice of Intent for Geophysical Exploration
NSO	BLM Nevada State Office
OHV	off-highway vehicle
O&G	Oil and Gas
O ₃	ozone
Pb	lead
PM ₁₀ and PM _{2.5}	particulate matter
PL	Public Law
PRIA	Public Rangelands Improvement Act
Project Area	Eight parcels consisting of approximately 15,831 acres of public land
RFD	Reasonably Foreseeable Development
RFFAs	Reasonably foreseeable future actions
RCRA	Resource Conservation and Recovery Act
ROW	right-of-way
SO ₂	sulfur dioxide
T28N, R35E	Township 28 North, Range 35 East
TCP	Traditional Cultural Property
USC	United States Code
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOCs	volatile organic compounds
WD	Winnemucca District
2005 O&G EA	<i>Winnemucca Field Office Oil and Gas Leasing Environmental Assessment</i> (NV-020-05-EA-21)

1.0 INTRODUCTION

1.1 Identifying Information

1.1.1 Title, EA Number, and Project Type

Title: September 2014 Competitive Oil and Gas Lease Sale

NEPA Number: DOI-BLM-NV-W010-2014-0013-EA

Type of Project: Competitive Oil and Gas Lease Sale

1.1.2 Location of Proposed Action

Eight parcels of land were nominated for the September 2014 Competitive Oil and Gas (O&G) lease sale. The eight parcels (Project Area) consist of approximately 15,831 acres of public land administered by the Bureau of Land Management (BLM), Winnemucca District (WD), Humboldt River Field Office. The Project Area is located in Buena Vista Valley, approximately four miles southeast of Unionville, in Pershing County, Nevada. The Project Area is accessed from State Route 400.

As shown on **Figure 1**, the Project Area is located within portions of Township 28 North, Range 35 East (T28N, R35E), sections 2, 10, and 12, T28N, R36E, sections 4, 6, 8, 18, and 30, T29N, R35E, sections 2, 4, 16, 24, 26, 28, 34, and 36, and T29N, R36E, sections 4, 6, 8, 16, 18, 20, 28, 30, and 32, Mount Diablo Base and Meridian. **Appendix A** contains a complete list of the nominated parcels and their legal descriptions.

1.1.3 Name and Location of Preparing Office

This Environmental Assessment (EA) is being prepared by the following BLM office:

Winnemucca District, Humboldt River Field Office

5100 E. Winnemucca Boulevard

Winnemucca, Nevada 89445

1.1.4 Applicant Name

BLM Nevada State Office (NSO)

1.2 Background

A programmatic EA (*Winnemucca Field Office Oil and Gas Leasing Environmental Assessment* NV-020-05-EA-21, hereafter referred to as the 2005 O&G EA) for O&G leasing within the WD was prepared in 2005. The 2005 O&G EA analyzed areas eligible for leasing in the WD, and developed standard stipulations which would apply for leasing, exploration, and development. The Project Area, located in Buena Vista Valley, was included in the 2005 O&G EA analysis and a Finding of No Significant Impact (FONSI) and Decision Record were signed on October 21, 2005. The present EA incorporates by reference, the 2005 O&G EA. The Proposed Action would be subject to the stipulations developed in the 2005 O&G EA and summarized in the

FONSI and Decision Record, along with other applicable state and local permitting requirements.

The objective of this EA is to evaluate potential environmental effects that may be associated with current O&G development technology (i.e., hydraulic fracturing (HF)), which was not considered in the 2005 O&G EA.

1.3 Purpose and Need for Action

The purpose of the action is for the BLM to offer nominated parcels for competitive O&G leasing in the September 2014 Competitive O&G Lease Sale. Offering nominated parcels for competitive O&G leasing provides private individuals the opportunity to secure leases that would allow for subsequent permitting of exploration and development to take place.

The sale of O&G leases is needed to allow continued exploration for O&G reserves which would help the United States meet its growing energy needs and to enable the United States to become less dependent on foreign oil sources. This action is being initiated to facilitate the WD implementation of the requirements in Executive Order (EO) 13212 (2001) and the National Energy Policy Act (2005).

1.4 Decision to be Made

The WD must determine whether or not to recommend leasing all or part of the nominated parcels in the upcoming September 2014 Competitive O&G Lease Sale to the Nevada BLM State Director by May 16, 2014. If there are no known resource conflicts that cannot be addressed using a standard stipulation, then the parcel may be deferred. As a result, the WD must determine which stipulations must be attached to the parcels in order to protect natural resources.

1.5 Scoping, Public Involvement, and Issues

Internal scoping meetings and review of the 2005 O&G EA determined the following issues with the Proposed Action:

- What are the potential impacts from hydraulic fracturing to water quality and quantity?
- What hazardous wastes may be generated if hydraulic fracturing is done? How might these wastes be handled?
- What are the potential impacts to air quality if hydraulic fracturing is done? What types of emissions are reasonably expected?
- What are the potential impacts from potential exploration and development to special status species, such as the Greater Sage-grouse?

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 Description of Proposed Action

2.1.1 Proposed Action

The Proposed Action considers leasing all or some of the eight nominated parcels located in the Buena Vista Valley area in the September 2014 lease sale. Stipulations and mitigation measures, or performance standards developed from this analysis would be applied to future O&G exploration and development on these leases. A complete list of potential stipulations that can be applied to the O&G lease parcels are located in Chapter 6 of the 2005 O&G EA.

2.1.2 Environmental Protection Measures

No environmental protection measures are part of the Proposed Action.

2.2 Description of Alternatives Analyzed in Detail

2.2.1 No Action Alternative

In accordance with BLM National Environmental Policy Act (NEPA) guidelines H-1790-1, Chapter 6, this EA evaluates the No Action Alternative. The objective of the No Action Alternative is to describe the environmental consequences that would result if the Proposed Action were not implemented. The No Action Alternative forms the baseline from which the impacts of all other alternatives can be measured. In the case of a lease sale, this would mean that all expressions of interest to lease (parcel nominations) would be denied or rejected.

Under the No Action Alternative, the BLM would withdraw the eight nominated lease parcels from the September 2014 lease sale. Surface management would remain the same and ongoing O&G development would only continue on previously leased federal, private, and state lands.

2.3 Alternatives Considered But Not Analyzed in Detail

No other reasonable alternatives were developed from internal scoping.

2.4 Reasonably Foreseeable Development Scenario for O&G Resources

Developing O&G resources on BLM administered public lands involves four phases: leasing, exploration, development/production, and final abandonment. The first phase is to issue a lease. Leasing of O&G resources confers an implied right to the lessee to explore and/or develop the O&G resources. The act of leasing does not directly result in surface disturbance activities; however, ground disturbance would occur during the second phase, exploration, and phase three, development. Phase four, final abandonment, would involve removing facilities and reclaiming the site. The BLM would require a separate site-specific NEPA analysis for exploration or development that includes final abandonment.

Any time during the 10-year term of the lease, the lessee, or operator, may submit specific plans for exploration and development to BLM for approval. These plans may be in the form of a Notice of Intent for Geophysical Exploration (NOI), or an Application for Permit to Drill (APD), Notice of Staking, or Sundry Notice. The BLM then reviews the submission to determine if there are any other site-specific conditions of approval that should be applied. Such conditions of approval must be consistent with the lease rights granted. In conjunction with obtaining approval to explore or develop a leased parcel, the operator may also seek a right-of-way (ROW) to access the leased lands.

A Reasonably Foreseeable Development (RFD) scenario for O&G is a long-term projection of exploration, development, production, and reclamation activity. The RFD covers O&G activity in a defined area for a specified period of time. The RFD projects a baseline scenario of activity assuming all potentially productive areas can be open under standard lease terms and conditions, except those areas designated as closed to leasing by law, regulation, or EO. The baseline RFD provides the mechanism to analyze the effects that discretionary management decisions have on O&G activity. The RFD also provides the basic information that is analyzed in the NEPA document under various alternatives. The RFD discloses future or potential impacts that could occur once the lands are leased. Prior to any future development, the BLM would require a site-specific NEPA analysis at the exploration and development stages in order to comply with NEPA.

The Proposed Action does not include any surface disturbance, such as exploration, development, production, or final reclamation of O&G resources. However, the authorization of O&G leasing does convey a right to subsequent exploration and production activities. Therefore, this EA will consider possible impacts from potential indirect effects under RFD scenarios not previously analyzed in the 2005 O&G EA.

General Assumptions for Surface Disturbance Associated with O&G Resources

Based on the information provided in Section 2.1.1 of the 2005 O&G EA, the RFD assumed that up to 20 wells could be drilled in Buena Vista Valley area. Each well pad and its associated access road would disturb approximately five acres, totaling 100 acres. One pipeline would disturb approximately one-acre. A main access and service road would result in five acres of disturbance. A power transmission line would disturb approximately five acres. Total surface disturbance for development of the Buena Vista Valley area was estimated to be approximately 111 acres.

It is impossible to predict with certainty how resource development would occur in the future. The interaction of prices, markets, technology, environmental concerns, and viability of the potential O&G resource in the Buena Vista Valley area all play a role. It would be highly speculative to assume that 20 production wells would be drilled in the Buena Vista Valley area, considering the advancements in directional drilling and well stimulation techniques. With directional and horizontal drilling technology, several wells can be drilled in a radial pattern from one drill pad/borehole, resulting in up to 50-85% less surface disturbance as compared to traditional vertical drilling practices using multiple, individual drill pads (Kreckel).

For the purpose of this RFD, we assume a conservative 50% reduction in the amount of surface disturbance than what was estimated for the Buena Vista Valley area in the 2005 O&G EA. As a result, the RFD in terms of surface disturbance is estimated to be approximately 56 acres within the eight nominated lease parcels.

The following paragraphs provide a general discussion of possible post-leasing RFD activities. All of these activities may require additional NEPA review.

Geophysical exploration is used to obtain detailed geologic information. A variety of exploration methods are employed, ranging from placing electrodes in the ground, to detonating explosives to create shockwaves, to employing specially constructed off-road vehicles to produce vibrations.

Exploratory drilling begins development of a lease. An NOI or an APD is filed with the BLM. A field examination is conducted and NEPA review is completed before a drilling permit is issued. An access road and a well pad are constructed for each well, if needed. Total disturbance attributed to drilling an exploration well is usually limited to five acres for the pad and access road. Statistically, over 95% of exploration wells are dry.

Well Stimulation/Hydraulic Fracturing (HF). Well Stimulation may be used to enhance oil and gas recovery. Several methods of well stimulation could be used. HF is one of these methods that is reasonably foreseeable for leases on this sale. HF is the process of applying high pressure to a subsurface formation via the wellbore, to the extent that the pressure induces fractures in the rock. Typically the induced fractures will be propped open with a granular “proppant” to enhance fluid connection between the well and formation. The process was developed experimentally in 1947 and has been used routinely since 1950. The Society of Petroleum Engineers estimates that over one million HF procedures have been completed in the United States and tens of thousands of horizontal wells have been drilled and hydraulically fractured (Cole 2013:17-20; Society of Petroleum Engineers 2012).

The BLM currently does not have any regulations in place regarding HF, but is working on drafting new regulations. However, the Nevada Division of Minerals (NDOM) is drafting regulations that require the reporting of the amount and type of chemicals used in a HF operation in “FracFocus” within 60 days of HF completion for public disclosure as part of the Conditions of Approval for all O&G drilling permits and sundry notices that include the HF process. For more information concerning FracFocus and HF, refer to the FracFocus website at www.fracfocus.org and the NDOM website at minerals.state.nv.us.

To ensure that O&G exploration and development is conducted in a safe and environmentally sound manner, the BLM approves and regulates all drilling and completion operations, and related surface disturbance on Federal public lands. Prior to approving an NOI or and APD, the BLM identifies all potential subsurface formations that will be penetrated by the wellbore. This includes all groundwater aquifers and any zones that would present potential safety or health risks that may need special protection measures during drilling, or that may require specific protective well construction measures.

Once the geologic analysis is completed, the BLM reviews the proposed casing and cementing programs to ensure the well construction design is adequate to protect the surface and subsurface environment, including the potential risks identified by the geologist and all known or anticipated zones with potential risks.

Before HF takes place, all surface casing and deeper, intermediate zones are required to be cemented from the bottom of the cased hole to the surface. The cemented well is pressure tested to ensure there are no leaks and a cement bond log is run to ensure the cement has bonded to the casing and the formation. If the fracturing of the well is considered to be a “non-routine” fracture for the area, the BLM would be onsite during those operations as well as when abnormal conditions develop during the drilling or completion of a well.

Wells that undergo HF may be drilled vertically, horizontally, or directionally and the resultant fracture induced by HF can be vertical, or horizontal, or both. Wells may extend to depths greater than 20,000 feet or less than 1,000 feet, and horizontal sections of a well may extend several thousand feet from the production pad on the surface.

Drilling muds, drilling fluids, water, and HF fluids are stored in on-site tanks or lined pits during the drilling and/or completion process. Equipment transport and setup can take several days, and the actual HF and flowback process can occur in a few days up to a few weeks. For oil wells, the flowback fluid from the HF operations is treated in an oil-water separator before it is stored in a lined pit or tank located on the surface. Where gas wells are flowed back using a “green completion process,” fluids are run through a multi-phase separator, which are then piped directly to enclosed tanks or to a production unit.

Hydraulic Fracturing Technology

A general description of the HF technology follows:

- All exploratory, testing, and production wells are multiply cased and sealed with cement between the wellbore and the formation. Well integrity is tested throughout the process.
- Drilling and HF fluids can be contained in a pitless system (aboveground tanks) or a lined pit. Cuttings could be contained in roll-off boxes for hauling to disposal or surface casing interval cuttings could be spread over the site during reclamation.
- HF fluids are recovered to a large degree in “flowback” or produced water when the well is tested or produced.
- All recovered fluids are generally handled by one of four methods:
 - Underground injection
 - Captured in steel tanks and disposed of at an approved disposal facility
 - Treatment and reuse
 - Surface disposal pits
- Drilling cuttings could be land farmed and buried on site three feet below root zones. Any cuttings that do not fit the waste profile would be disposed of at an approved disposal facility.

In-field drilling of additional exploration wells typically occurs when initial drilling has located O&G, to define the limits of the O&G reservoir. The process of in-field drilling is the same as that employed for initial exploratory drilling, although new roads and pads may not be required in every instance.

Production begins only if O&G can be transported to a market and sold at a profit. In the WD, because of limited infrastructure, produced oil would likely be piped a short distance for temporary storage, then trucked to a refinery for processing. Production facilities may include one or more of the following: a well head, pumping equipment, a separation system, pipelines, a metering system, storage facilities, water treatment and injection facilities, cathodic protection systems, electrical distribution lines, compressor stations, communication sites, roads, salt water disposal systems, dehydration sites, and fresh/salt water plant sites.

Well abandonment may be temporary or permanent. Wells are sometimes shut-in because pipelines or roads needed for production and marketing do not exist and the cost for construction is not justified by the quantity of oil discovered. These wells may later be reentered when their production can be marketed. The permanent abandonment of a well occurs when the well is determined to no longer have a potential for economic production, or when the well cannot be used for other purposes.

Reclamation. Abandonment includes removal of facilities and reclamation of surface disturbance. In the case of exploration wells which do not find economically recoverable amounts of oil, initial reclamation (recontouring) is usually completed the following year which provides for sufficient time for the reserve pit to dry out. After revegetation of the site is completed, usually within two to three years, reclamation is complete. If an exploration well finds economically recoverable quantities of oil, all disturbed surface except the small amount needed for a pump and access is reclaimed immediately.

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

A study conducted by the National Research Council (National Research Council 2013) studied the issue of induced seismic activity from energy development. The study found that:

- The process of hydraulic fracturing a well as presently implemented for shale gas recovery does not pose a high risk for inducing felt seismic events.
- Injection for disposal of waste water derived from energy technologies into the subsurface does pose some risk for induced seismicity, but very few events have been documented over the past several decades relative to the large number of disposal wells in operation.

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

Water Consumption. Public concern over the amount of water used in HF has increased over the last couple of years. There are numerous groundwater protection regulations already in place, and new increases in protection are in the works at state and federal levels, while the debate over HF continues at all levels of government. Because of the increased interest in Nevada's potential for oil discovery, this issue has come under scrutiny. Prior to the advancements in HF and directional drilling, 20,000 to 80,000 gallons of water were typically consumed per well, but with today's advanced fracturing techniques, water consumption during fracturing can be in excess of 8,000,000 gallons of water per well (Kharaka et al. 2013; Swackhamer 2013:64-65). Water use in the Barnett, Fayetteville, and Marcellus Shales is under 4,000,000 gallons per well though (Jenner and Lamadrid 2013).

Water rights (i.e., permission to apply water to beneficial use) are controlled by the Nevada Division of Water Resources (NDWR), not the BLM. Additional discussion regarding water rights is located in Section 3.8.1.

Water Contamination Potential. There is a broad array of chemicals that can be used as additives in a fracture treatment including, but not limited to, hydrochloric acid, anti-bacterial agents, corrosion inhibitors, gelling agents (polymers), surfactants, and scale inhibitors (Kharaka et al. 2013). These chemical additives constitute up to 1-5% of the HF fluid (Swackhamer 2013:67). This translates to a minimum of 5,000 gallons of chemicals for every 1.5 million gallons of water used to fracture a well (Paschke 2011), or at least 26,000 gallons of additive for an O&G well requiring 8,000,000 gallons of water for HF activities.

Produced water, a byproduct of O&G production, may be considered another potential contributor of groundwater contamination. This water has generally been confined to O&G bearing rock formations for a long period of time and can obtain high levels of dissolved solids, and dissolved gasses such as methane and radon (Kharaka et al. 2013; Farag and Harper in press; Vengosh et al. 2013). The majority of produced water in Nevada is reintroduced into deep brine formations by way of Underground Injection Control wells. A permit to inject produced water must be obtained from the NDWR and a Sundry Notice must be approved by the BLM. The BLM receives its guidelines and directions for disposal of produced water from Onshore Order #7. Certain O&G exploration and production wastes occurring at or near wellheads are exempt from the Clean Water Act (CWA), such as: drilling fluids, produced water, drill cuttings, well completion, and treatment and stimulations fluids to name a few. In general, the exempt status of exploration and production waste depends on how the material was used or generated as waste, not necessarily whether the material is hazardous or toxic. For example, some exempt exploration and production wastes might be harmful to human health and the environment, and many non-exempt wastes might not be as harmful (EPA 2002).

Air Quality. There is a potential for impacts to air quality associated with lease development activities, such as fugitive dust produced from well pad and access road construction, pipeline construction, hauling freshwater and produced water to and from well sites. All of these activities can be considered temporary or short-term. Air quality for Nevada is regulated and monitored by the Nevada Division of Environmental Protection (NDEP). Development of unconventional O&G resources has also been identified as a source of GHGs, particularly methane, and volatile organic compounds (VOCs) (Robinson 2013). The level of production is a subject of debate in the literature (Howarth et al. 2011, 2012).

The activities that are associated with O&G exploration and production would be further analyzed in depth as part of a site-specific NEPA analysis when and if an NOI or an APD were received.

2.5 Conformance

The Project Area is subject to the BLM, WD Sonoma-Gerlach Management Framework Plan (MFP), dated July 9, 1982 (BLM 1982). Objective M 5.5 of the Sonoma-Gerlach MFP opens the resource area to O&G leasing with stipulations. The stipulations used in this document have their basis in the MFP. The Proposed Action is in conformance with the MFP.

The intent of this EA is to identify critical elements of the human environment that are subject to requirements specified in statutes or EOs and must be considered in all BLM EAs and environmental impact statements.

The Proposed Action and No Action Alternative would be in conformance with the NEPA of 1969 (Public Law (PL) 91-190 as amended (42 United States Code (USC) § 4321 et. seq.)), Mineral Leasing Act (MLA) of 1920 as amended and supplemented (30 USC § 181 et. seq.), the Federal O&G Leasing Reform Act of 1987, which includes the regulatory authority under 43 Code of Federal Regulations (CFR) 3100, Onshore O&G Leasing; General, and Title V of the Federal Land Policy and Management Act (FLPMA) under the regulatory authority of 43 CFR 2800 for ROWs. The Proposed Action and alternatives described and analyzed in this document are consistent with other federal, state, and local laws, regulations, plans and policies to the maximum extent possible, while being consistent with federal law and FLPMA.

2.6 Relationship to Laws, Regulations, and Other Plans

The Proposed Action would be in conformance with the WD, *Regional Geothermal/Oil and Gas Leasing Environmental Assessment* (EA-NV-020-2-38) N-11921 approved June 1982, and the supporting WD Instruction Memorandum (IM) No. 84-160 and subsequent revision dated March 7, 1984. In September 2002, the WD completed a *Geothermal Resources Leasing Programmatic Environmental Assessment* (EA-NV-020-02-029), that addressed geothermal resources leasing on certain lands within the WD boundaries. A Decision Record/FONSI was issued by the WD on September 10, 2002. A Modified Decision Record/FONSI was issued by the WD on September 13, 2002. The Decision Records updated geothermal leasing stipulations based on new resource information and analysis of mandatory critical elements. There are overlaps of the assessment areas from the geothermal leasing EA with the assessment area of the Proposed Action. Many of the stipulations developed in these documents will be carried forward into this current analysis where appropriate.

The 2005 O&G EA analyzed areas eligible for leasing in the WD and developed standard stipulations which would apply for leasing, exploration, and development. The Project Area, located in Buena Vista Valley, was included in the 2005 O&G EA analysis and a FONSI and Decision Record were signed on October 21, 2005. The Proposed Action would be in conformance with the 2005 O&G EA. This EA incorporates by reference, the 2005 O&G EA. The Proposed Action would be subject to the stipulations developed in the 2005 O&G EA and

summarized in the FONSI and Decision Record, along with other applicable state and local permitting requirements.

The Proposed Action is consistent with:

- MLA of 1920, as amended and supplemented by subsequent legislation,
- FLPMA of 1976, which calls for managing the public lands for multiple use,
- 43 CFR Part 3100, which provides regulations governing Onshore O&G Leasing,
- EO 133212, which directs the Secretary of the Interior to expedite energy-related projects,
- National Historic Preservation Act (NHPA) and rules for implementing Section 106 found at 36 CFR Part 800,
- Endangered Species Act (ESA) and rules for implementation of Section 7 found at 50 CFR Part 402,
- Clean Air Act (CAA). The BLM has air resource program responsibilities through its permitting programs and CAA requirements,
- Secretarial Order 3289 addresses current and future impacts of climate change on America's land, water, wildlife, cultural-heritage, and tribal resources,
- CWA of 1977 provides the statutory basis for regulating discharges of pollutants into waters of the United States and regulating water quality for surface waters,
- Nevada statutes and plans governing management of wildlife and water resources,
- Washington Office IM 2012-43, December 22, 2011, Greater Sage-grouse Interim Management Policies and Procedures,
- Washington Office IM 2010-117, May 17, 2010, O&G Leasing Reform – Land Use Planning and Lease Parcel Reviews, and the,
- Washington Office IM 2011-154, July 26, 2011, Requirement to Conduct and Maintain Inventory Information for Wilderness Characteristics and to Consider Lands with Wilderness Characteristics in Land Use Plans.

3.0 THE AFFECTED ENVIRONMENT

In the 2005 O&G EA, conventional O&G exploration, development, and production was analyzed; however, HF was not considered in the document. This EA tiers to and references the 2005 O&G EA wherever possible.

Supplemental Authorities

The BLM is required to consider specific elements of the human environment that are subject to requirements specified in statute or regulation or by EO. **Table 3-1** outlines the elements that must be considered in all EAs.

Table 3-1 List of Supplemental Authorities

Supplemental Authorities	Not Present	Present Not Affected	Present Affected
Air Quality			X
Areas of Critical Environmental Concern	X		
Cultural Resources			X
Environmental Justice	X		
Floodplains	X		
Historic Trails (Including visual setting)	X		
Invasive, Non-Native Species			X
Migratory Birds			X
Native American Religious Concerns			X
Prime or Unique Farmlands	X		
Threatened & Endangered Species	Refer to Section 3.6		
Wastes, Hazardous or Solid			X
Water Quality (including Quantity)			X
Wetlands and Riparian Zones			X
Wild and Scenic Rivers	X		
Wilderness	X		

Additional Affected Resources

Other elements or resources of the human environment that have been considered for the EA are listed in **Table 3-2**.

Table 3-2 Additional Resources Considered for Analysis

Additional Resources Considered for Analysis	Not Present	Present Not Affected	Present Affected
Fisheries	The proposed lease parcels contain no permanent sources of surface water that are suitable habitat for fish.		
Geology and Minerals			X
Lands and Realty/Land Use Authorizations			X
Lands With Wilderness Characteristics	The proposed lease parcels and their surroundings do not have the characteristics needed to be considered Land with Wilderness Characteristics		
Paleontological Resources	The proposed lease parcels are in areas of Potential Fossil Yield Classes 1 and 3. There is a low to moderate probability of yielding Paleontological Resources that would be covered under BLM IM no. 2009-011. No significant vertebrate fossils have been found in or within 1-mile of the lease parcels.		
Rangeland Management		There would be no direct impacts to range resources from issuing leases for future O&G exploration, development, production, and final abandonment activities. The impacts on range resources during all phases would be minimal. O&G activities are limited to a very small area; impacts would be extremely small as related to the entire range resource. The allotments covered in this EA include the Klondike, Rawhide	

		and Star Peak Allotments. Total acreage for these three allotments is approximately 441,881 acres versus an estimated surface disturbance associated with O&G resources within the eight nominated lease parcels of approximately 56 acres.	
Recreation	X		
Socio-Economics		The anticipated scale of operations is considered to have minimal impact on the economics of Pershing County.	
Soils		No slope in excess of 25%.	
Special Status Species			X
Vegetation			X
Visual Resources		X	
Wild Horse and Burro			X
Wildlife			X

3.1 Air Quality

3.1.1 Regulatory Framework

The United States Environmental Protection Agency (EPA) has established national ambient air quality standards (NAAQS) for criteria pollutants, including carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM₁₀ and PM_{2.5}), sulfur dioxide (SO₂), and lead (Pb). The EPA has delegated regulation of air quality under the federal CAA to the State of Nevada. In addition to the criteria pollutants, regulations also exist to control the release of hazardous air pollutants (HAPs). HAPs are chemicals that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. EPA currently lists 188 identified compounds as HAPs, some of which can be emitted from O&G development operations, such as benzene, toluene, and formaldehyde. Ambient air quality standards for HAPs do not exist; rather, these emissions are regulated by the source type, or specific industrial sector responsible for the emissions. For more information on pollutant monitoring values please visit the EPA's AirData website at www.epa.gov/airdata.

Greenhouse gases (GHGs) as defined by the EPA include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and fluorinated gases (EPA 2013). Combustion of fossil fuels results in emissions of GHGs. The *Final Mandatory Reporting of Greenhouse Gases Rule* issued by the EPA in 2009 set reporting standards for producers of GHGs.

3.1.2 Assessment Area

In the State of Nevada, the airshed boundaries primarily correspond to those of the hydrographic areas delineated by the NDWR. The Proposed Action would occur in the Buena Vista Valley Hydrographic Basin (**Figure 3**), as defined by the NDWR. This hydrographic area covers approximately 471,145 acres.

3.1.3 Existing Environment

The Proposed Action is located in a rural area with minimal industrial sources or potential contribution of emissions to the air shed from vehicle traffic. Potential human uses in the immediate Project Area consist of grazing-related land uses, dispersed recreation, and seasonal Native American pine nut collection.

Because Pershing County is designated unclassifiable or attainment for all NAAQS, additional air conformity analysis is not needed for the Proposed Action. Any future exploration or development would occur in Buena Vista Valley Hydrographic Basin, within Pershing County, Nevada. This basin is not a maintenance area for any criteria pollutants and is in attainment for all NAAQS and Nevada air quality standards.

Climate Change

Climate change refers to any significant change in the measures of climate lasting for an extended period of time. In other words, climate change includes major changes in temperature, precipitation, or wind patterns, among other effects, that occur over several decades or longer.

Global warming refers to the recent and ongoing rise in global average temperature near Earth's surface. It is caused mostly by increasing concentrations of GHGs in the atmosphere. Global warming is causing climate patterns to change. However, global warming itself represents only one aspect of climate change (EPA 2013).

3.2 Cultural Resources

3.2.1 Regulatory Framework

The Archaeological and Historic Preservation Act (AHPA) of 1960, as amended (PL 86-523, 16 USC 469 et. seq.); NHPA of 1966, as amended (PL 89-665, 16 USC 470 et. seq.); and the Archaeological Resources Protection Act (ARPA) of 1979, as amended (PL 96-95, 16 USC 470aa-mm).

3.2.2 Assessment Area

The area of direct and indirect effects of the Proposed Action is defined as the footprint of the lease parcels.

3.2.3 Existing Environment

Numerous prehistoric and historic archaeological sites with widely varying degrees of complexity, size, location and densities occur within Buena Vista Valley. To provide a framework for understanding the cultural resources in Buena Vista Valley, an overview of the cultural history of the area is contained in Section 3.2.1 of the 2005 O&G EA.

A Class I literature review was conducted. There have been nine Class III cultural surveys, covering less than 5% of the area of the Proposed Action. The majority of the surveys were done for clearing seismic lines or single pole transmission lines. In the areas that have been surveyed, no sites have been found. The implications of this are discussed in Section 4.2 of this EA.

3.3 Invasive and Non-Native Species

3.3.1 Regulatory Framework

EO 13112 defines “invasive species” and the definition includes plants designated as “noxious” by Federal or State law. Within Nevada, NRS 555.005 defines noxious weeds.

3.3.2 Assessment Area

The assessment area for direct and indirect impacts is the proposed lease sale boundaries and access roads within one-mile leading in and/or out of the proposed lease sale boundaries.

3.3.3 Existing Environment

Currently, only perennial pepperweed (*Lepidium latifolium*), a Nevada Category “C” weed has been documented within the proposed lease sale boundaries. Hoary cress (*Cardaria draba*) has been documented within 0.5 miles of the proposed lease sale boundaries. Hoary cress is also a Nevada Category “C” weed. Nevada Category “C” weeds are those weeds which are widely established in many or all of the counties in the state, actively eradicated from nursery stock dealer premises, and for which the requirement for control is at the discretion of the state quarantine officer. Both documented populations occur within existing road ROWs. Cheatgrass (*Bromus tectorum*), Russian thistle (*Salsola spp.*) and other non-native, invasive annual plant species are common throughout the assessment area.

3.4 Migratory Birds

3.4.1 Regulatory Framework

Migratory birds are protected and managed under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 USC 703 et. seq.), and EO 13186.

On April 12, 2010, the United States Fish and Wildlife Service (USFWS) and BLM signed a Memorandum of Understanding (MOU) pursuant to EO 13186. The purpose of the MOU is to strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and avoid or minimize adverse impacts on migratory birds through enhanced collaboration between the USFWS and BLM, in coordination with state, tribal, and local governments. The MOU identifies specific activities where cooperation between the USFWS and BLM will contribute to the conservation of migratory birds and their habitat.

3.4.2 Assessment Area

The area of direct and indirect effects is defined as the footprint of the proposed lease parcels.

3.4.3 Existing Environment

Under the MBTA, nests (nests with eggs or young) of migratory birds may not be harmed, nor may migratory birds be killed. All birds in the WD are considered migratory birds with the exception of gallinaceous birds such as the California quail (*Lophortyx californicus*), Chukar (*Alectoris graeca*), and Sage-grouse (*Centrocercus urophasianus*). Migratory birds may be found in any area of the district as either seasonal residents or as migrants.

Migratory birds associated with the predominant vegetative communities of sagebrush and salt desert shrub within the Project Area may include: Black-throated sparrow (*Amphispiza bilineata*), Brewer's blackbird (*Euphagus cyanocephalus*), Brewer's sparrow (*Spizella breweri*), Burrowing owl (*Athene cunicularia*), Canyon wren (*Catherpes mexicanus*), Gray flycatcher (*Empidonax wrightii*), Green-tailed towhee (*Pipilo chlorurus*), Loggerhead shrike (*Lanius ludovicianus*), Rock wren (*Salpinctes obsoletus*), Sage sparrow (*Amphispiza belli*), Sage thrasher (*Oreoscoptes montanus*), Western meadowlark (*Sturnella neglecta*), Horned lark (*Eremophila alpestris*), and Vesper sparrow (*Pooecetes gramineus*) (Great Basin Bird Observatory 2003).

During a migratory bird survey conducted in June 2013 in Buena Vista Valley, the following birds were documented; Sage sparrows, Long-billed curlews (*Numenius americanus*), and Prairie falcons (*Falco mexicanus*).

Several species of raptors utilize the Project Area and may include: Bald eagle (*Haliaeetus leucocephalus*), Golden eagle (*Aquila chrysaetos*), Burrowing owl (*Athene cunicularia*), Ferruginous hawk (*Buteo regalis*), Northern goshawk (*Accipiter gentilis*), Northern harrier (*Circus cyaneus*), Red-tailed hawk (*Buteo jamaicensis*), Short-eared owl (*Asio accipitrinus*), and Sharp-shinned hawk (*Accipiter striatus*).

The Bald eagle, Golden eagle, Burrowing owl, Northern goshawk, Brewer's sparrow, Loggerhead shrike, and Sage sparrow are also BLM designated sensitive species and are discussed in Section 3.12 "Special Status Species."

3.5 Native American Religious Concerns

3.5.1 Regulatory Framework

In addition to ARPA and the NHPA, numerous laws and regulations require the BLM to consider Native American Religious Concerns. These include, but are not limited to, EO 13007 (Indian Sacred Sites), EO 13175 (Consultation and Coordination with Tribal Governments), and the American Indian Religious Freedom Act (AIRFA) of 1978 (PL No. 95-341). Consultation is done in accordance with Secretarial Order No. 3317 and BLM Manual section H-8120-1 (General Procedural Guidance for Native American Consultation).

3.5.2 Assessment Area

The direct effects assessment area is the lease parcels. The area for indirect effects is three miles from the lease boundaries.

3.5.3 Existing Environment

Letters requesting consultation were sent to the following tribes on March 4, 2014: Battle Mountain Band, Fallon Paiute Shoshone Tribe, Lovelock Paiute Tribe, Pyramid Lake Paiute Tribe, and the Winnemucca Indian Colony. An informational meeting between the BLM and the Fallon Paiute Shoshone Tribe was held on February 28, 2014.

From previous consultations on O&G lease sales and geothermal exploration, the Northern Paiute tribes have indicated that Kyle Hot Springs is a Traditional Cultural Property (TCP) and any drilling should be kept at least one-mile from the spring. A formal ethnographic study has not been done, and the spring is currently unevaluated under the criteria for listing in the National Register of Historic Places (NRHP). Details of some of the consultations concerning the potential TCP are contained in the 2005 O&G EA in Sections 3.5 and 4.5. The closest lease parcel to Kyle Hot Springs is approximately 2.5 miles.

As documented in Section 3.5 of the 2013 *New York Canyon Geothermal Utilization and Interconnect Project EA* (DOI-BLM-NV-W010-2012-0005-EA), a series of NRHP eligible TCPs are located further south in the Stillwater Range. The closest lease parcel to one of these TCPs is approximately 10 miles. Given the distance from the lease parcels, these TCPs would not be impacted from the lease sale or subsequent development activities which may occur. As a result, they are dropped from analysis in Chapter 4.

3.6 Threatened and Endangered Species

3.6.1 Regulatory Framework

The ESA as amended (16 USC 1531-1544, 87 Stat. 884), requires the BLM in coordination with the USFWS, to ensure that any federal action or funding would not adversely affect a federally listed species. The BLM 6840 Manual (Special Status Species Management) also has language dealing with ESA-listed species.

3.6.2 Assessment Area

The assessment area considered for threatened and endangered species is T29N, R35E; T29N, R36E; T28N, R35E; and T28N, R36E.

3.6.3 Existing Environment

A list of federally listed, proposed, or candidate species was requested from the USFWS for the proposed Project Area on February 28, 2014, through the Information, Planning and Conservation System (IPaC) website. Based on the query through IPaC, the Greater Sage-grouse and Lahontan cutthroat trout (LCT) were the only federally listed, proposed, or candidate species that may occur within the Project Area. There are no other known Threatened or Endangered species in the proposed Project Area present within the area of analysis.

There are no occupied LCT streams within the Project Area and there is no Greater Sage-grouse habitat within the Project Area.

3.7 Wastes, Hazardous or Solid

3.7.1 Regulatory Framework

Hazardous substances are identified and regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). *Hazardous substances* as defined in 40 CFR 373.4 refers to a group of substances defined as hazardous under CERCLA 101(14), and appear in reference Table 302.4. The elements, compounds, and hazardous wastes appearing in Table 302.4 are designated as *listed hazardous substances* under section 102(a) of CERCLA. *Hazardous substances* also include unlisted solid wastes that exhibit characteristics of ignitability, corrosivity, reactivity, or toxicity. The term *hazardous substance* does not include petroleum, crude oil, or any fraction of crude oil unless it is specifically listed or designated, and the term does not include natural gas or synthetic gas useable as fuel (40 CFR 300.5).

Hazardous wastes are identified and regulated under the Resource Conservation and Recovery Act (RCRA). Hazardous wastes are defined as solid wastes that exhibit one or more of the characteristics of ignitability, corrosivity, toxicity, or reactivity, or are listed as a hazardous waste in 40 CFR Part 261 Subpart D. *Solid wastes* that are not hazardous by the RCRA definition, normally referred to as "solid wastes," are basically any relatively benign materials that are discarded. Solid wastes can include domestic or industrial refuse, vegetative debris from land clearing, discarded construction materials, drill cuttings, and some discarded materials used for drilling and plugging wells.

3.7.2 Assessment Area

The area of direct and indirect effects is defined as the footprint of the proposed lease parcels.

3.7.3 Existing Environment

As previously described, the eight parcels comprising the Project Area consist of approximately 15,831 acres of public land. Public land in this area is interspaced with sections of privately-held land in a checkerboard-like configuration.

Hazardous materials, hazardous waste, and solid waste are not normally considered to be part of the natural environment. These items are, rather, the result of human intrusion into the natural environment. This EA is concerned with hazardous materials, hazardous waste, and solid waste used or generated by exploration and development activities resulting from leasing under the Proposed Action.

For purposes of this section, we are concerned with *hazardous materials*, *hazardous substances*, *hazardous waste*, and *solid waste*. *Hazardous materials* is the most generic and inclusive term. It has been defined as any substance that, due to quantity, concentration, physical, chemical, or infectious characteristic, may present substantial danger to public health, welfare, or the environment when released. The term includes *hazardous substances* and *hazardous waste*. Examples of hazardous materials include petroleum, natural gas, synthetic gas, toxic chemicals, and low-level radioactive sources. There are no known hazardous materials in the Project Area.

3.8 Water Quality (including Quantity)

3.8.1 Regulatory Framework

The administration, preservation, and appropriation of water resources in Nevada include both state and federal regulations. The NDEP has its own permit programs under provision of state law and the federal CWA.

NDWR has been granted authority by the EPA to enforce drinking water standards established under the CWA. The Nevada Water Pollution Control Law gives the State Environmental Commission authority to require controls on diffuse sources of pollutants, if the pollutants have the potential to degrade the quality of the waters of the state.

Water rights (i.e., permission to apply water to beneficial use) are controlled by the NDWR, not the BLM. Nevada water law has the flexibility to accommodate new and growing uses of water in Nevada while protecting those individuals who have used the water in the past. Nevada water law is based on two fundamental concepts: prior appropriation and beneficial use. Prior appropriation (also known as "first in time, first in right") allows for the orderly use of the state's water resources by granting priority to senior water rights. This concept ensures that senior uses are protected, even as new uses for water are allocated.

In Nevada, any water usage for O&G development has to be applied for through the NDWR. NDWR may award the applicant with a temporary permit for a specific amount of water to complete drilling and well development activities, including possible HF methods. Once permission to apply water to beneficial use is obtained, the applicant either has to develop their own water supply or obtain water from an existing water source. Once the oil well operation is completed (including HF), continued use of the water permitted under a temporary water right

for which the beneficial use no longer exists is prohibited, and any temporary water wells must be plugged according to state standards for well abandonment.

BLM Manuals 7240 and 9184 address water quality (Safe Drinking Water Act, as amended (43 USC 300f et seq.) and CWA of 1977 (33 USC 1251 et seq.)) and BLM Manual 7250 addresses water rights.

3.8.2 Assessment Area

The assessment area for surface water quality and quantity coincides with the Buena Vista Valley Hydrographic Basin below the elevation of 4,320 feet above sea level. This approximates the relatively flat valley bottom in which the proposed parcels reside (**Figure 2**). Any potential direct or indirect impacts to surface water would not be expected to extend past this boundary.

The assessment area for groundwater quality and quantity coincides with the Buena Vista Valley Hydrographic Basin. This represents an approximate closed system of precipitation and groundwater recharge (**Figure 3**). Any potential direct or indirect impacts to groundwater would not be expected to extend past this boundary.

3.8.3 Existing Environment

Surface Water Resources

The Project Area, as described in Sections 3.8.1 and 3.8.2 of the 2005 O&G EA, falls within the Great Basin physiographic province and can be accurately described as a high desert. Precipitation within the area is orographically controlled and elevation dependent. Much of the assessment area lies within the radius of influence of the rain shadow affect created by the Sierra Nevada Mountains. The majority of stream flow is derived during the spring in direct response to the melting of the snow pack. Riparian vegetation exists in the mountainous areas prior to the water being lost as recharge.

The nature of the basin bottom (referred to as a playa) in which the proposed parcels fall, would likely lend to a portion of the area being classified as “other waters of the United States”. Playas in this region are generally saline and their soil is comprised of fine clay, fine sand, and chemical precipitates (i.e., salts). Where water frequently pools or flows on these surfaces in response to spring runoff or direct response to precipitation, indicators of “ordinary high water marks” can develop and areas within these indicators can be considered “other waters of the United States”. These waters are subject to the regulations of the CWA of 1977 (33 USC 1251 et seq.). The BLM is not aware of any state water quality standards for the intermittent or ephemeral surface waters which occur seasonally on or near the proposed parcels.

Springs

There are several springs within the assessment area. Perched or contact springs are the most common type of spring encountered. These springs are typically not directly connected with the surrounding water table and are generally unaffected by groundwater flow.

A less common, but ecologically and culturally significant spring that is encountered in the assessment area is the thermal spring. These springs are surface expressions of geothermal resources and are discussed in further detail in Section 3.10.3.

Groundwater Resources

An overview of groundwater resources of the Buena Vista Valley area is contained in Section 3.8.3 of the 2005 O&G EA. As previously stated, the Project Area is located in the Buena Vista Valley Hydrographic Basin. Between 1963 and 2013, the United States Geological Survey (USGS) collected groundwater measurements at a well (Site #402640118015002) located approximately two miles north of the nominated parcels. Depth to water ranged from 5.17 feet below ground surface (ft bgs) in 1996 to 33.33 ft bgs in 2004. The most recent measurement collected in April 2013, indicated that the groundwater surface was 22.80 ft bgs.

Buena Vista Valley is an internally draining basin with no apparent underflow to adjacent basins (Harrill et al. 1988). According to the NDWR, Buena Vista Valley has a perennial yield of 10,000 af/year¹ and was designated by the Nevada State Engineer in Order #0732 in 1979. Within Buena Vista Valley, 25,469.37 af/year are committed (i.e., permitted) through 197 permits or certificates. Use of this water is broken down as follows; Industrial – 550.00 af/year, Irrigation – 20,105.66 af/year, Mining and Milling – 3,901.69 af/year, and Stockwater – 912.02 af/year.

Water Quality

An overview of the water quality of the Buena Vista Valley area is contained in Section 3.8.4 of the 2005 O&G EA. In typical hydrographic basins, water quality would be best in the mountains where precipitation is most common. Surface water flowing from the mountains and groundwater near the mountain front would generally be of good quality. However, near the basin center, water quality would be less due to evapotranspiration.

Water in the Buena Vista Valley area would be of lower quality due to localized hydrothermal activity and high mineral content. Buena Vista Valley is reported by Garcia and Jaconobi (1991) to have eight water analyses from wells in the valley. All but two of these water samples appeared to have total dissolved solids concentrations in excess of drinking water standards.

3.9 Wetlands and Riparian

3.9.1 Regulatory Framework

BLM Manual 6740 addresses Wetlands and Riparian Zones (EO 11990 Protection of Wetlands 5/24/77).

¹ Acre-foot per year. An acre-foot is the amount of water needed to cover one square acre, one foot deep.

3.9.2 Assessment Area

The assessment area for wetlands and riparian zones coincides with the Buena Vista Valley Hydrographic Basin below the elevation of 4,320 feet above sea level. This approximates the relatively flat valley bottom in which the proposed parcels reside (**Figure 2**). Any potential direct and indirect impacts to wetlands and riparian zones would not be expected to extend past this boundary.

3.9.3 Existing Environment

A wetland delineation of the assessment area has not been completed; however, the nature of the area in which the proposed parcels are located indicates that some areas around the parcels could be classified as wetlands. A portion of the area is mapped in the National Hydrographic Dataset (NHD) as a playa. The condition of any wetlands and riparian zones in the area has not been documented. The BLM has not collected any Proper Functioning Condition data on riparian habitats within the assessment area. Due to the low gradient of the assessment area, it is unlikely that degradation due to erosion has occurred. Because erosion is of lower concern, any changes in riparian plant communities due to grazing are not likely to decrease the functionality of the site with respect to the habitats ability to resist erosion.

3.10 Geology and Minerals

3.10.1 Regulatory Framework

O&G leasing is a principal use of the public lands and current BLM policy encourages orderly development of leases and makes mineral resources available to meet national, regional, and local energy needs. This policy is based in various laws, including the MLA of 1920 and Section 102(a)(12), 103(1) of the FLPMA of 1976. The Federal Onshore O&G Leasing Reform Act of 1987 (Section 5102(a)(b)(1)(A)) directs the BLM to conduct quarterly O&G lease sales in each state whenever eligible lands are nominated and available for leasing. Leases would be issued pursuant to 43 CFR 3100 and BLM IM-2010-117. Stipulations attached to leases serve as terms and conditions which provide protections to other resources on the parcel(s).

In Nevada, O&G resources are classified for regulation and management as a mineral; therefore, issues relating to the O&G resource are discussed in this section with all mineral resources. Separate descriptions of the surficial geology, mineral resources, geothermal resources, and O&G resources of the assessment area are presented below. The assessment of potential impact to O&G and mineral resources resulting from additional O&G resource development are combined.

Mining activities are authorized by Congress under the 1872 General Mining Law (30 USC 22 et. seq.) as amended. The BLM implements the General Mining Law under the 43 CFR 3809 regulations. Further policies related to mining are the Mining and Mineral Policy Act of 1970 (30 USC 21a) and the Materials and Minerals Policy Research and Development Act of 1980 (PL 96-479).

Geothermal leasing and resource development were authorized by Congress through the Geothermal Steam Act of 1970, Title 30, USC, Chapter 23, Sections 1001 et seq. (30 USC 1001 et seq.). The BLM implements the geothermal program according to regulations found at 43 CFR 3200. Additional policies related to geothermal resources include the Energy Independence and Security Act of 2007 (PL 110-140) and the 2005 Energy Policy Act; The National Energy Policy, EO 13212.

3.10.2 Assessment Area

The area of direct and indirect effects is defined as the footprint of the proposed lease parcels.

3.10.3 Existing Environment

BLM's Legacy Rehost System (LR2000) database provides reports on BLM land and mineral use authorizations for oil, gas, and geothermal leasing, coal and other mineral development, land and mineral title, and mining claims located on federal lands or on federal mineral estate. Based on February 2014 LR2000 reports for the eight nominated parcels, existing mining claims are located in portions of T28N, R35E, section 10, T28N, R36E, section 18, and T29N, R35E, sections 28, 34, and 36. Although mining claims are currently located within the boundaries of the nominated parcels, there are currently no active mine sites or mine exploration projects within the parcel boundaries. In addition, according to LR2000, no O&G leases, geothermal leases, or solid mineral leases are currently located within the footprint of the eight nominated lease parcels.

Geology

As summarized in Section 3.15.1 of the 2005 O&G EA, the assessment area is located in the Great Basin portion of the Basin and Range physiographic province of the western United States. The assessment area is part of the Central Hydrographic Region. In general, it is the bedrock formations of the region that host various metal deposits of economic value. In contrast, many of the industrial mineral deposits occur in the sediments filling valleys between mountain ranges.

Oil and Gas Resources

As discussed in Section 3.15.2 of the 2005 O&G EA, in October 1993, Independence Mining Inc. drilled a mineral exploration hole approximately 4,000 feet south-southwest of Kyle Hot Springs, located in Buena Vista Valley. The drilling operation intercepted geothermal water that appeared to contain crude oil. This discovery prompted an O&G competitive lease sale in this area in 1994. Since 1994, approximately seven O&G exploration wells have been drilled on federal leases in the north end of Buena Vista Valley, near Kyle Hot Springs. To date, there has been no production from the area.

Mineral Resources

Economic minerals of the region fall into the two broad categories: metals and industrial minerals. The metals deposits tend to occur in the bedrock formations of the mountain blocks while industrial minerals are commonly found in the valley fill sediments.

There are 45 mining districts in Pershing County. Mines of Pershing County have extracted tungsten, antimony, iron, gypsum, diatomite, mercury, gold, silver, and copper (Johnson 1977). The extractable mineral resources occur on the flanks of mountain ranges throughout the county. However, many of the mining districts incorporate portions of the adjacent valleys.

Geothermal Resources

The geothermal resources for the Buena Vista Valley area are described in Section 3.15.4 of the 2005 O&G EA. Kyle Hot Springs, located in Buena Vista Valley, discharges water at between 159°F and 204°F from a reservoir estimated to have a temperature in the range of 340°F to 381°F (Garside and Schilling 1979). These springs are located approximately one-mile west of the mountain front fault on the western side of the East Range and are associated with several intersecting fault sets.

Geothermal leases located approximately 10 miles south of the Project Area have been sold. In October 2010, a proposed exploration project was analyzed in a BLM document titled, *New York Canyon, Geothermal Exploration Project Environmental Assessment* (DOI-BLM-NV-W010-2010-0004-EA). A proposed development project was analyzed in a subsequent document titled, *New York Canyon Geothermal Utilization and Interconnect Project Environmental Assessment* (DOI-BLM-NV-W010-2012-0005-EA).

3.11 Lands and Realty

3.11.1 Regulatory Framework

Public lands under BLM administration are managed for multiple use under the FLPMA of 1976. Under FLPMA, the BLM is authorized to grant, issue and renew ROWs over, upon, under or through public lands. The assessment areas are traversed by BLM-permitted ROWs for roads, utility needs, and other infrastructures. Implementation of the Act is through the 43 CFR 2800 regulations.

3.11.2 Assessment Area

The area of direct and indirect effects is defined as the footprint of the proposed lease parcels.

3.11.3 Existing Environment

There are two existing ROWs in the Project Area (**Figure 4**). ROW N-007639 is associated with a 345 kilo-volt (kV) transmission line for the Sierra Pacific Power Company. The Sierra Pacific Power Company also holds ROW N-024394 within the Project Area for a second 345 kV transmission line.

3.12 Special Status Species

3.12.1 Regulatory Framework

BLM Manual 6840 entitled, Special Status Species Management, states BLM special status species are those that: 1) are listed or proposed for listing under the ESA, and 2) species requiring special management consideration to promote their conservation and reduce the likelihood and need for future listing under the ESA, which are designated as Bureau sensitive by the State Director(s). Additionally, all federal candidate species, proposed species, and delisted species in the five years following delisting will be conserved as Bureau sensitive species. A number of the parcels proposed for leasing may have populations of sensitive plants or animals. The sensitive species list can be found in IM-NV-2011-059.

Bald and Golden eagles are protected under the Bald and Golden Eagle Protection Act (16 USC 668-688d). Other raptor species are protected by state and federal laws. The Nevada Department of Wildlife (NDOW) has a target species list of raptors outlined in the Nevada Wildlife Action Plan.

3.12.2 Assessment Area

The area of direct and indirect effects is defined as the footprint of the proposed lease parcels.

3.12.3 Existing Environment

The Nevada Natural Heritage Program (NNHP) database (February 2014) and the NDOW Diversity database (February 2014) were consulted for the possible presence of endangered, threatened, candidate and/or sensitive plant or animal species. Data shows observations of Bald eagle, Golden eagle and Northern goshawk. The USFWS indicated a potential for LCT and Greater Sage-grouse from the IPaC report run on February 28, 2014. According to NDOW, February 27, 2014, there is potential habitat for Burrowing owls and the Pale kangaroo mouse (*Microdipodops pallidus*) with the proposed lease parcels.

Based upon the above queries, the following special status species have been documented within or are likely to occur within the Humboldt Herd Area (HA).

Bald Eagle - The Bald eagle may potentially occur incidentally as a very rare migrant in the analysis area; however, no known foraging, nesting or roosting areas occur locally. For this reason, proposed activities are judged to have no effect on this species or its habitats and it will be dismissed from further analysis.

Brewer's Sparrow - The Brewer's sparrow may be found in this area since it typically inhabits sagebrush communities. The Brewer's sparrows tend to favor areas dominated by shrubs rather than grass. They thrive where extensive areas of sagebrush habitat are maintained with shrubs occurring in tall, clumped, and vigorous stands. They place their nests low in sagebrush (preferred), other shrubs, or cactus, from a few centimeters to about one-meter from ground. They would also place nests higher in taller sagebrush (Rich 1980). The Brewer's sparrow mainly forages for insects on the ground.

Burrowing Owl - Burrowing owls prefer open, arid, treeless landscapes with low vegetation. They are dependent upon burrowing mammal populations for maintenance of nest habitat and choose nesting areas based on burrow availability (Floyd et al. 2007). These birds are highly adaptable and readily nest in open, disturbed areas such as golf-courses, runways, and industrial areas that border suitable habitat (Neel 1999). Dense stands of grasses and forbs within owl home ranges support populations of rodent and insect prey. Urbanization is the biggest threat to this species as suitable habitat is converted to non-habitat by human use (Floyd et al. 2007).

Golden Eagle - Golden eagles are primarily cliff nesters and would utilize the area to forage for prey species such as jackrabbits and other small mammals. Golden eagles are protected under the Bald and Golden Eagle Protection Act. Nevada's golden eagle population is thought to be stable to increasing. They are widespread and frequently encountered (Floyd et al. 2007).

Lahontan Cutthroat Trout - LCT were addressed in Section 3.6 "Threatened and Endangered Species" and will not be addressed here.

Loggerhead Shrike - Loggerhead shrikes may be found in sagebrush/bunchgrass and salt desert scrub vegetative communities, so it is possible that they occur within the assessment area. Loggerhead shrikes tend to favor arid, open country with just a few perches or lookouts. They nest in isolated trees and large shrubs and feed mainly on small vertebrates and insects. The species is relatively common and well distributed across the state (Neel 1999). These birds benefit from habitat with a diverse structure and species composition. Healthy sagebrush communities provide these habitat characteristics. According to Paige and Ritter (1999), "Long-term heavy grazing may ultimately reduce prey habitat and degrade the vegetation structure for nesting and roosting. Light to moderate grazing may provide open foraging habitat".

Northern Goshawk - The Northern goshawk is an opportunistic hunter, preying on a wide variety of vertebrates and, occasionally, insects. Prey is taken on the ground, in vegetation, or in the air. It forages in both heavily forested and relatively open habitats. In Nevada, it forages in open sagebrush (*Artemisia spp.*) adjacent to riparian aspen stands. It nests in a wide variety of forest types including deciduous, coniferous, and mixed forests. Western birds also nest in deciduous forests dominated by aspen (*Populus tremuloides*), paper birch (*Betula papyrifera*), or willow (*Salix spp.*) (Bechard et al. 2006).

Pale Kangaroo Mouse - The pale kangaroo mouse is found in valley bottoms in fine sandy soils that are dominated by greasewood and saltbush in the lower elevations of their range and in areas of sagebrush in at the higher elevations of their range. These mammals typically utilize Indian ricegrass and other forbs, but will also consume insects during the summer months. (NDOW WAP 2013)

Sage-Grouse - The Greater Sage-grouse was addressed in Section 3.6 "Threatened and Endangered Species" and will not be addressed here.

3.13 Vegetation

3.13.1 Regulatory Framework

The FLPMA, Public Rangelands Improvement Act (PRIA) of 1978, and 43 CFR 4180, all provide direction and goals for vegetation management within the WD. Plants are also included on the BLM's special status species list.

3.13.2 Assessment Area

The area of direct and indirect effects is defined as the footprint of the proposed lease parcels.

3.13.3 Existing Environment

The assessment area supports vegetation typical of the Great Basin region. The extremes of climate, elevation, exposure and soil type all combine to produce a diverse growth environment for a wide variety of plants. The following environments and plant communities are represented within the assessment area:

Barren Playa. Approximately 10.6% of the assessment area is composed of lakebeds. Playas are generally devoid of vegetation due to high concentrations of salts associated with standing water that slowly evaporates after rains. Sandy islands with vegetation occasionally form on the lakebeds.

Desert Sink Scrub. Approximately 46% of the assessment area is composed of desert sink scrub plant community. It occurs in valley bottoms throughout the assessment area. Black greasewood (*Sarcobatus vermiculatus*) is an indicator of a high water table and is closely associated with alkali meadows and dry bottomland. This vegetation type mainly produces less palatable shrubs and few grasses. Annual precipitation ranges from three to eight inches. Plants growing here are: Big sagebrush (*Artemisia sp.*), Shadscale (*Atriplex confertiflora*), Gray molly (*Bassia Americana*), Alkali rabbitbrush (*Chrysothamnus parryi*), Seepweed (*Suaeda sp.*), Alkali sacaton (*Sporobolus airoides*), Inland saltgrass (*Distichlis spicata*), Indian ricegrass (*Achnatherum hymenoides*), Bottlebrush squirreltail (*Elymus elymoides*), and Bluegrass (*Poa sp.*).

Saltbush Scrub. This vegetation type covers approximately 43% of the assessment area. The ecological sites associated with this type occur mainly in the valleys on alluvial fans and up into the hills in the southern portion of the assessment area. Annual precipitation ranges from three to eight inches. In these areas, the vegetation is dominated by Shadscale and Bud sagebrush (*Picrothamnus desertorum*), Bailey greasewood (*Sarcobatus baileyi*), Douglas rabbitbrush (*Chrysothamnus douglasii*), Four-wing saltbush (*Atriplex canescens*), or Winterfat (*Krashennikovia lanata*). Perennial grasses include Indian ricegrass, Bottlebrush squirreltail, Needle and thread (*Hesperostipa comate*), Sand dropseed (*Sporobolus cryptandrus*), and Desert needlegrass (*Achnatherum speciosum*).

Sagebrush Scrub Plant Community. The sagebrush community makes up less than 0.4% of the vegetation within the assessment area approximately. Sagebrush scrub is the second most

common vegetation type in the assessment area. Sagebrush is not as tolerant of saline soils as Saltbush. Big sagebrush occurs mainly in the mountains and hills and is less common in the southern half of the planning area, which is dryer and warmer. This community is dominated by four subspecies of Great Basin sagebrush (*Artemisia tridentata* ssp. *tridentata*, ssp. *Wyomingensis*, ssp. *vaseyana* and ssp. *lahontensis*). The height of this scrub is between 1 and 6.5 feet tall and total cover can range from 10% on degraded sites to nearly 60%. More commonly, shrub cover is about 25% of the ground while forbs and grasses cover another 25%.

While sagebrush often form pure stands, more commonly it is associated with many other shrub species primarily Desert peach (*Prunus andersoni*), and Green ephedra (*Ephedra viridis*). Rubber and sticky leaf Rabbitbrush (*Chrysothamnus nauseosus* and *C. viscidiflorus*) are common early successional species following fires. Spiny hopsage (*Grayia spinosa*) frequently occurs at the lower elevations and is part of the transition at lower elevations with the saltbush scrub community. Common grasses in the sagebrush scrub include Squirreltail grass (*Elymus elymoides*), Great Basin wildrye (*Elymus cinereus*), Sandburg bluegrass (*Poa secunda*), Muttongrass (*Poa fendleriana*), Bluebunch wheatgrass (*Pseudoroegneria spicata*), Thurber needlegrass (*Achnatherum thurberianum*), and Needle and thread grass. Cheatgrass (*Bromus tectorum*) is a major problem in this community after fires.

3.14 Wild Horse and Burro

3.14.1 Regulatory Framework

The BLM is responsible for the protection, management, and control of wild horses and burros on public lands in accordance with the Wild Free-Roaming Horse and Burro Act of 1971 as amended (PL 92-195 Act) which states that BLM “shall manage wild free-roaming horses and burros in a manner that is designed to achieve and maintain a thriving natural ecological balance on the public lands.”

3.14.2 Assessment Area

The area of direct and indirect effects is defined as the footprint of the proposed lease parcels.

3.14.3 Existing Environment

Portions of the lease parcels are located inside of the Humboldt HA. The Humboldt HA consists of 431,544 acres, however, the acreage of the parcels inside the HA totals 1,002 acres. The Humboldt HA is not designated as a Herd Management Area (HMA) in the Sonoma-Gerlach MFP; therefore, no Appropriate Management Level has been set by the BLM.

BLM specialists have documented large herds of wild horses from along the western side of the HA to Packard Flats. The estimated population as of February 2014 is approximately 185 wild horses. During a flight conducted in June 2013, 124 wild horses were observed utilizing the area on the western portion of the HA between the Humboldt River Ranch community.

3.15 Wildlife

3.15.1 Regulatory Framework

Section 102.8 of FLPMA states that it is the policy of the United States to manage public land in a manner that protects the quality of multiple resources, and the land provides food and habitat for fish, wildlife and domestic animals. PRIA requires the BLM to improve rangeland conditions with due consideration of the needs of wildlife.

Wildlife and fish resources and their habitats are managed cooperatively by the BLM and NDOW under an MOU. Essentially, BLM manages wildlife habitat, while NDOW manages wildlife populations.

3.15.2 Assessment Area

The area of direct and indirect effects is defined as the footprint of the proposed lease parcels.

3.15.3 Existing Environment

Terrestrial wildlife resources in the Project Area are typical of the Northern Great Basin. A wide variety of wildlife species common to the Great Basin ecosystem can be found within the Project Area. Common large and small wildlife species occurring in the area include Mule deer (*Odocoileus hemionus*), Pronghorn antelope (*Antilocapra americana*), Coyote (*Canis latrans*), Blacktail jackrabbit (*Lepus californicus*), Desert cottontail (*Sylvilagus auduboni*), Bobcat (*Lynx rufus*), numerous raptors, reptiles, and other small mammal species.

Mule Deer - The Humboldt Range to the west of the Project Area provides Mule deer with crucial summer and crucial winter habitat as does the East Range on the east side of the Project Area. The Project Area itself may be occasionally used as migration corridor between these two mountain ranges. Mule deer generally feed on forbs, grasses, and shrubs depending on the time of year. Forbs and grasses are most important in spring and summer while shrubs are most utilized during winter and dry summer months.

Pronghorn Antelope - There Project Area lies within year-round pronghorn habitat. Rangelands with a mixture of grasses, forbs, and shrubs provide the best habitat for pronghorn. Pronghorn seem to prefer habitats with shrub heights between 10-25 inches.

4.0 DIRECT AND INDIRECT IMPACTS

The following sections analyze the Proposed Action and No Action Alternative for direct and indirect impacts. As described in each of the following sections, potential impacts from the RFD scenarios could be mitigated by application of stipulations developed in the 2005 O&G EA. Based on the following analyses, no parcels will be deferred from leasing.

4.1 Air Quality

4.1.1 Proposed Action

While the act of leasing the parcels would produce no direct air quality effects, potential future development of the leases could lead to increases in area and regional emissions. Since it is unknown if the parcels would be developed, or the extent of the development, it is not possible to reasonably quantify potential air quality effects through dispersion modeling or another applicable method at this time. Further, the timing, construction and production equipment specifications and configurations, and specific locations of activities are also unforeseeable at this time. Additional air effects will be addressed in a subsequent analysis when the lessee files an APD. All proposed activities including, but not limited to, exploratory drilling activities would be subject to applicable local, state, and federal air quality laws and regulations.

Any subsequent activity authorized after NOI or APD approval could include soil disturbances resulting from the construction of well pads, access roads, pipelines, power lines, and drilling. Any disturbance is expected to cause increases in fugitive dust and potentially inhalable particulate matter (specifically PM₁₀ and PM_{2.5}) in the Project Area and immediate vicinity. Particulate matter, mainly dust, may become airborne when drill rigs and other vehicles travel on dirt roads to drilling locations. Air quality may also be affected by exhaust emissions from engines used for drilling, transportation, gas processing, compression for transport in pipelines, and other uses. These sources will contribute to potential short and long term increases in the following criteria pollutants: CO, ozone (a secondary pollutant, formed photochemically by combining VOCs and N₂O emissions), NO₂, and SO₂ (Adgate et al. in press). Non-criteria pollutants such as CO₂, CH₄, N₂O, air toxics (e.g., benzene), and total suspended particulates could also be emitted (Adgate et al. in press). Gases from the O&G production stream, such as hydrogen sulfide, CO₂, VOCs, light organics volatilized from exempt wastes in reserve pits, impoundments or production equipment were exempt from the CAA regulations by the EPA in 2002 (EPA 2002).

Certain pollutants may be significant when evaluating air quality related values (AQRV) for effects on visibility and atmospheric deposition. Significance will depend greatly on the proximity to sensitive receptors, area meteorology, and the background levels of AQRV at any sensitive receptor. Dust control measures, such as applying a layer of gravel over the travel surfaces, watering travel surfaces, and reducing speed along the roadways can be very effective in mitigating dust issues.

During exploration and development, 'natural gas' may at times be flared and/or vented from conventional, coal bed methane, and shale wells. The gas is likely to contain GHGs and VOCs that could also be emitted from reserve pits, produced water disposal facilities, and/or tanks

located at the site. The development stage may likely include the installation of pipelines for transportation of raw product. New centralized collection, distribution and/or gas processing facilities may also be necessary. The level of production is a subject of debate in the literature (Howarth et al. 2011, 2012; Jenner and Lamadrid 2013:443-445).

4.1.2 Recommended Mitigation

There are no specific stipulations applicable for air quality at the O&G leasing phase. Any exploration or development on an O&G lease would require separate NEPA and conditions of approval or stipulations could be applied at that time to mitigate potential adverse impacts.

The BLM encourages industry to incorporate and implement best management practices (BMPs) to reduce impacts to air quality by reducing emissions, surface disturbances, and dust from field production and operations. Measures may also be required as conditions of approval on permits by either the BLM or the applicable state air quality regulatory agency. The BLM also manages venting and flaring of gas from federal wells as described in the provisions of Notice to Lessees 4A, Royalty or Compensation for Oil and Gas Lost.

Some of the following measures, depending on rules and regulations in effect at the time, could be imposed at the development stage:

- flaring or incinerating hydrocarbon gases at high temperatures to reduce emissions of incomplete combustion,
- vapor recovery systems where petroleum liquids are stored,
- water dirt and gravel roads during periods of high use and control speed limits to reduce fugitive dust emissions,
- co-located wells and production facilities to reduce new surface disturbance, and
- directional drilling and horizontal completion technologies whereby one well provides access to petroleum resources that would normally require the drilling of several vertical wellbores.

More specific to reducing GHG emissions, industry is addressing technologies to prevent the release of methane from O&G wells (IFC 2014). Furthermore, the EPA is expected to promulgate new federal air quality regulations that would require GHG emission reductions from many O&G sources.

4.1.3 No Action Alternative

The No Action Alternative would not lease parcels in 2014. The only potential changes to air quality that could occur would be from the exploration or development of O&G and geothermal lease parcels previously sold in competitive lease sales. In addition, permitted mining activities would continue to produce pollutants, some of which are currently regulated.

4.2 Cultural Resources

4.2.1 Proposed Action

The leasing of O&G parcels does not entail ground-disturbing activities as part of the undertaking. Therefore, this undertaking will not result in impacts to cultural resources in and of

itself; however, as detailed in Section 4.2.1 of the 2005 O&G EA, ground disturbance from lease development may result in substantial impacts to cultural resources. The lease parcels may also contain historic properties, TCP, and/or sacred sites currently unknown to the BLM that were not identified during the lease parcel review process. Indirect impacts to cultural resources are also described in Section 4.2.1 of the 2005 O&G EA. HF would not pose any new direct or indirect impacts. In addition to the mitigations described below, specific and/or more stringent mitigations for potential direct and indirect effects could be developed in the NEPA documentation for a specific exploration or development proposal.

4.2.2 Recommended Mitigation

The potential direct impacts from reasonably foreseeable O&G exploration and development would be prevented through the Section 106 process of the NHPA and the State Protocol Agreement between the Nevada BLM and the Nevada State Historic Preservation Officer. Compliance with Section 106 of NHPA and the State Protocol includes identification of cultural resource sites through Class III inventory, as well as recordation and evaluation of these sites for National Register eligibility, and evaluation of project effects on National Register eligible sites. Extensive recordation, evaluation and mitigation may be required in culturally sensitive areas. If avoidance is not possible, then the most common form of mitigation is through data collection and excavation.

All subsequent activities on leased parcels shall be subject to Section 106 of the NHPA and further NEPA study. The following stipulation developed in the 2005 O&G EA:

Controlled Or Limited Surface Use: (avoidance and/or mitigation measures to be developed). All surface disturbing activities proposed after issuance of the lease are subject to compliance with Section 106 of the National Historic Protection Act (NHPA) and its implementation through the protocol between the BLM Nevada State Director and the Nevada State Historic Preservation Officer.

would be added to the terms and conditions of all the lease parcels in the Proposed Action.

4.2.3 No Action Alternative

Under the No Action Alternative, the parcels would not be leased and no O&G development would occur in the foreseeable future. The cultural resources would continue to be managed as they currently are.

4.3 Invasive and Non-Native Species

4.3.1 Proposed Action

The act of offering, selling, and issuing federal O&G leases does not directly produce invasive/non-native species impacts. Subsequent development produces ground disturbance which can lead to the spread of invasive/non-native species. The construction of access roads and well pads may unintentionally contribute to the establishment and spread of noxious weeds. Noxious weed seed could be carried to and from the Project Area by numerous methods,

including construction equipment, the drilling rig and transport vehicles. The main mechanism for seed dispersion on roads and well pads is by equipment and vehicles that were previously used and/or driven across or through noxious weed infested areas. The potential for the dissemination of invasive and noxious weed seed may be elevated by the use of construction equipment typically contracted out to companies that may be from other areas.

Cheatgrass and other weedy annuals are common along roadsides and other disturbed areas. These and the other species of noxious weeds are spread by vehicle traffic, livestock, wind, water, recreational vehicles, and wildlife. There would also be potential for new species of weeds to be transported onto the site by construction equipment. Any disturbance of soil or removal of vegetation would create opportunity for weeds to establish or spread into the surrounding plant community. In disturbed areas, bare soils and the lack of competition from an established perennial plant community would allow weed species opportunity to grow and produce seed. However, successful reclamation using a seed mix adapted to the site in conjunction with integrated weed management would create an opportunity to improve vegetative communities and reduce the amount of weedy species in the Project Area. HF would not create new direct or indirect impacts to invasive/non-native species.

4.3.2 Recommended Mitigation

To reduce the threat of invasive and noxious weeds, the following stipulation:

Invasive, Non-Native Species

During all phases of exploration and development, the lessee shall maintain a noxious weed control program consisting of monitoring and eradication for species listed on the Nevada Designated Noxious Weed List (NRS 555.010).

Areas to be developed will be inventoried for the presence of invasive non-native species before disturbance. During close out operations, sites shall be inventoried for the presence of these species and treated if weeds are present.

The BLM will develop and the operator will implement a weed treatment program from the time operation commences until the site is abandoned. Seed and mulch used to reclaim disturbed areas shall be free of invasive nonnative species

would be added to the terms and conditions of all the lease parcels in the Proposed Action.

4.3.3 No Action Alternative

There would be no direct or indirect impacts to invasive/non-native species from O&G development under the No Action Alternative. Invasive/non-native species and noxious weeds would potentially continue to be spread by vehicle traffic, livestock, wind, water, recreational vehicles, and wildlife.

4.4 Migratory Birds

4.4.1 Proposed Action

There would be no direct effects from issuing new O&G leases because leasing does not directly authorize O&G exploration and development activities. Direct and indirect impacts from these activities would be analyzed under a separate site-specific NEPA analysis. HF fluids could pose impacts to migratory birds depending on the chemistry of the fluids.

O&G development could affect migratory birds in a variety of direct and indirect ways. While a substantial amount of additional work is necessary to determine the distribution and demography of populations that could be affected by the Proposed Action, information gathered from other O&G developments and knowledge of the environmental consequences of habitat alteration and pollutants provides sufficient information to assess potential impacts. Potential impacts are summarized below, but a more thorough analysis of how migratory bird species would be affected by activities associated with O&G development would be assessed during site-specific EAs that would be prepared for each lease.

Environmental effects of O&G resource development are similar to other activities affecting terrestrial habitat, and surface and groundwater. While each species would respond differently to various impacts, all of them could be affected by activities that alter the thermal, physical, or chemical characteristics of their habitats. Physical habitat alteration could result from on-site facility construction, road and power line construction. Impacts of groundwater removal could affect spring and stream discharge (which could modify physical, chemical, and thermal characteristics of aquatic habitats), and alter the thermal characteristics of soils. Surface discharge of thermal waters could also affect chemical and thermal characteristics of habitats that are important to terrestrial and aquatic communities.

Avian species could be most affected by direct and indirect influences of power line construction, operation, and maintenance, and include constructing roads, building towers, and stringing high-tension power lines. Potential direct effects include habitat alteration and fragmentation, modification of thermal and chemical characteristics of surface waters that could affect riparian vegetation that is used for nesting and foraging, and mortality from electrocution when power lines are used for roosting. Indirect effects are largely attributed to increased human activity, which could displace individuals or reduce nesting success of species that are sensitive to disturbance. Road construction could also increase access into areas that are currently remote and provide for additional legal and illegal take.

Species associated with larger aquatic habitats (e.g., aquatic, marshland, and riparian species) could be adversely affected by increased activity in riparian systems (e.g., road construction, disturbances that increase erosion, etc.) and by changes in water quality that could be associated with surface release of O&G water or construction materials.

4.4.2 Recommended Mitigations

To reduce the threats to migratory birds, the following stipulation:

Migratory Birds

Surface disturbing activities during the migratory bird nesting season (March to July) may be restricted in order to avoid potential violation of the Migratory Bird Act. Appropriate inventories of migratory birds shall be conducted during analysis of actual site development. If active nests are located, or if other evidence of nesting is observed (mating pairs, territorial defense, carrying of nesting material, transporting of food), the proponent shall coordinate with BLM to establish appropriate protection measures for the nesting sites. Protection measures may include avoidance or restricting or excluding development in certain areas until nests and nesting birds will not be disturbed. After July 31, no further avian survey, will be conducted until the following year. During development and production phases, if artificial ponds potentially detrimental to migratory birds are created, these shall be fitted with exclusion devices such as netting or floating balls.

would be added to the terms and conditions of all the lease parcels in the Proposed Action.

4.4.3 No Action Alternative

The No Action Alternative would not authorize the proposed parcels for lease sale and the possible subsequent exploration or production activities and reclamation would not occur. As a result, no impacts to migratory birds would be expected from O&G operations.

4.5 Native American Religious Concerns

4.5.1 Proposed Action

There would be no direct effects from issuing new O&G leases because leasing does not directly authorize O&G exploration and development activities. Direct impacts from these activities would be analyzed under a separate site-specific NEPA analysis. O&G exploration and production activities, as outlined in the RFD scenario, have the potential to affect Native American Religious Concerns as follows:

- The flow or temperature of hot springs could be affected by O&G drilling. Hot springs, which are considered sacred by Native Americans, could dry up or become cooler in temperature. Contamination from fracking fluids, while remote, is also a possibility. Since the thermal water in these springs is considered sacred, this would result in a loss of these sacred sites, and the healing energy and power they provide to the Native Americans who value them.
- Kyle Hot Springs is located on private surface. The lack of legal access, which could prevent proper monitoring of the hot spring, could be a potential impact to the unevaluated TCP.
- Depending on the infrastructure put used to develop any oil or gas discovery, visual impacts to the setting of the unevaluated TCP at Kyle Hot Springs could occur.

4.5.2 Recommended Mitigation

To reduce the impacts to the unevaluated Kyle Hot Springs TCP and any other potential TCPs, the following stipulation:

Controlled or Limited Surface Use: (avoidance and/or mitigation measures to be developed): For development and production phases, surface occupancy may be limited to a specific distance or precluded at hot springs, sacred sites, or TCPs pending conclusion of the Native American consultation process. All development activities proposed under the authority of this lease are subject to the requirement for Native American consultation prior to BLM authorizing the activity. Depending on the nature of the lease developments proposed and the resources potentially affected, Native American consultation and mitigation measures to avoid significant impacts could significantly extend time frames for processing authorizations for development activities and change the ways in which developments are implemented.

Native Americans shall be allowed to access to sacred sites and Traditional Cultural Properties on and through oil and gas leases. Access to Native American sacred sites and Traditional Cultural Properties shall not be precluded by oil and gas exploration and development activities.

Should previously unidentified human remains or funerary objects be discovered during surface disturbing activities, all surface disturbing activities in the immediate vicinity of the discovery shall cease and BLM shall be notified. Surface disturbing activities shall not be reinitiated in the immediate vicinity of the discovery until authorized by the BLM.

This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, EO 13007, or other statutes and executive orders. The BLM will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated.

As surface disturbing activities occur, the BLM will require that the operator monitor the water temperature and outflow of water from local hot springs and existing wells. This may require the operator to make a good faith effort to obtain access across private property. If the temperature and outflow of the water from the spring or well are impacted, the BLM will require the operator to take corrective actions. Failure of the operator to take the corrective measures as directed could result in BLM's terminating the operation

would be added to the terms and conditions of all the lease parcels in the Proposed Action.

4.5.3 No Action Alternative

Under the No Action Alternative, no leases would be sold and there would not be any foreseeable O&G development in the area near Kyle Hot Springs. The only potential impacts to Kyle Hot Springs that could occur would be: 1) from the exploration or development of O&G and geothermal lease parcels previously sold in competitive lease sales; or 2) activities by the landowner(s) of the property where Kyle Hot Springs is located.

4.6 Threatened and Endangered Species

4.6.1 Proposed Action

There would be no direct effects from issuing new O&G leases because leasing does not directly authorize O&G exploration and development activities. At present, there are no threatened and endangered species identified. Within the life of the lease, species could be listed as threatened and endangered that may reside in the lease area. If present and affected, Section 7 consultation would take place prior to any drilling activities during the site-specific NEPA analysis, with level of consultation to be determined based upon the project site-specific Proposed Action. Direct and indirect impacts from these activities would be analyzed under a separate site-specific NEPA analysis. HF fluids could pose impacts to threatened and endangered species depending on the chemistry of the fluids. Specific mitigation measures determined by the BLM would be enforced to prevent or minimize the take of a listed species as a result of drilling.

4.6.2 Recommended Mitigation

To reduce the threats to threatened and endangered species, the following stipulation:

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

Exploratory endeavors on the public lands will require a special status species review, and may require a field survey for the presence of special status species. Potential impacts to special status species will be analyzed on a case-by-case

basis. Mitigation measures will be developed on an individual project basis depending upon the results of the survey.

would be added to the terms and conditions of all the lease parcels in the Proposed Action.

4.6.3 No Action Alternative

The No Action Alternative would not authorize the proposed parcels for lease sale and the possible subsequent exploration or production activities and reclamation would not occur. As a result, no impacts to threatened and endangered species would be expected.

4.7 Wastes, Hazardous or Solid

4.7.1 Proposed Action

There would be no direct effects from issuing new O&G leases, because leasing does not directly authorize O&G exploration and development activities. However, there would be possible indirect effects from leasing if exploration and development occur. There is a broad array of chemicals that can be used as additives in HF fluid including, but not limited to, hydrochloric acid, anti-bacterial agents, corrosion inhibitors, gelling agents (polymers), surfactants, and scale inhibitors. HF fluids could be considered a hazardous material depending on the chemical composition. Potential indirect effects following NOI or APD approval could be in the form of drilling fluid spills, chemical spills, fuel spills, trash scatter on and off well pads, and hydrocarbon or gas releases (Adgate et al. in press). There is also a potential of surface or groundwater contamination from spills or releases from ponds and tanks. If any hazardous materials and wastes on the leases are properly managed in accordance to federal and state regulations, then there would be no or only insignificant soil, groundwater, or surface water contamination.

4.7.2 Recommended Mitigation

To reduce the threat of hazardous and solid wastes, the following stipulation:

Hazardous Materials/Waste and Solid Waste

Prior to exploration and development, an approved emergency spill response plan will be developed to include contingencies for hazardous material and/or hazardous waste spills.

would be added to the terms and conditions of all the lease parcels in the Proposed Action.

4.7.3 No Action Alternative

If the parcels are not made available for O&G leasing, then O&G exploration, development and possible production would not occur. Accordingly, there would be no direct impacts from hazardous materials due to O&G development.

Indirect impacts from the No Action Alternative would be similar to those described in the Proposed Action.

4.8 Water Quality (including Quantity)

4.8.1 Proposed Action

The sale of parcels and issuance of O&G leases is strictly an administrative action. The act of offering, selling, and issuing federal O&G leases does not produce direct impacts to water quality, water quantity, or surface water. On-the-ground impacts would not occur until a lessee applies for and receives approval to drill on the lease. Additional NEPA analysis would be conducted prior to approval of an NOI or APD and would provide site-specific analysis for the well location. Exploration and development activities on the lease parcels would be assessed on a site-specific and wellhead basis for environmental impacts and water quality/quantity impacts before they would be approved. HF fluids could pose indirect impacts to water quality and quantity.

The BLM cannot determine at the leasing stage whether or not a proposed parcel will actually be sold, or whether or not the lease would be explored or developed if it were to be sold and issued. Consequently, the BLM cannot determine exactly where a well or wells may be drilled or what technology may be used to drill and produce wells, so the impacts listed below are generic, rather than site-specific.

Surface Water: Subsequent development of a lease may result in long and short-term alterations to the hydrologic regime depending upon the intensity of development. Clearing, grading, and soil stockpiling activities associated with exploration and development actions could alter short-term overland flow and natural groundwater recharge patterns resulting in *de minimis* risk². Potential impacts include surface soil compaction caused by construction equipment and vehicles, which would likely reduce the soils ability to absorb water, increasing the volume and rate of surface runoff. New roads, drill pads, pipelines, and powerlines, could cut slopes and alter channel and floodplain characteristics at drainage crossings. The combination of increased surface disturbance, surface runoff, decreased infiltration and changes in drainage features could result in increased peak flows in *de minimis* conditions. The success or failure of integrated measures, BMPs (see The Gold Book, Fourth Edition – Revised 2007), and appropriate mitigation measures designed to manage storm water and reduce erosion during construction and operation of O&G facilities will determine much of the impact with regard to surface waters.

Runoff associated with storm events could increase sediment/salt loads in surface waters; however, because the proposed parcels are essentially in the bottom of a basin, salt and sediment loads would not be expected to be transported outside of the basin by surface water flows. The

² *de minimis* risk. In risk assessment, it refers to a level of risk that is too small to be concerned with. Some refer to this as a "virtually safe" level. National Library of Medicine [Toxicology Glossary - http://sis.nlm.nih.gov/enviro/iupacglossary/glossaryr.html](http://sis.nlm.nih.gov/enviro/iupacglossary/glossaryr.html)

distance of the parcels to potentially impacted surface waters would restrict effect on the amount of sediment and salt contributed by lease exploration and development activities.

Surface erosion would be greatest during construction and would be controlled through integrated measures, BMPs, and appropriate mitigation measures. The magnitude of the impacts to surface water resources from future development activities depends on the proximity of disturbances to drainage channels, slope aspect and gradient, degree and area of soil disturbance, soil character, duration of construction activities, and the timely implementation and success/failure of mitigation measures. Natural factors which attenuate the transport of sediment and salts into susceptible water bodies include water available for overland flow; the texture of the eroded material; the amount and kind of ground cover; slope shape, gradient, length; and surface roughness. Impacts would likely be greatest shortly after the start of construction activities and would likely decrease in time due to stabilization, reclamation, and revegetation efforts.

Minor long-term direct and indirect impacts to the watershed and hydrology could continue for the life of surface disturbance from water discharge from roads, road ditches, and well pads, but would decrease once all well pads and road surfacing material has been removed and reclamation has taken place. Short-term direct and indirect impacts to the watershed and hydrology from access roads that are not surfaced with impervious materials would occur and would likely decrease in time due to reclamation efforts.

Although there is potential for O&G development to contribute sediment loads to aquatic systems, there is no reasonable likelihood that siting adjustments, state and federally-imposed sedimentation and storm-control measures, and reclamation strategies would fail to provide adequate means to effectively prevent substantive off-site transport and delivery of sediments or fluids that may impair downstream riparian or aquatic conditions in the closed basins.

Groundwater: HF is designed to change the producing formations' physical properties by increasing the flow of O&G into the well bore. HF may also introduce chemical additives into the producing formations. Chemical additives used in HF activities for the well would be introduced into the producing formations, but should mostly be pumped back out before production.

O&G wells are cased and cemented at a depth below usable water zones and O&G production zones generally do not contain freshwater; consequently, impacts to water quality at springs and groundwater wells would not be expected. Impacts to groundwater resources could occur due to failure of well integrity, failed cement along the length of the borehole, and surface spills. Concentrations of HF additives vary considerably and are not always known since different mixtures can be used for different purposes in O&G development and even in the same well bore.

Loss of drilling fluids may occur at any time in the drilling process due to changes in porosity or other properties of the rock being drilled. If this occurs, drilling fluids could be introduced into the surrounding formations, which may include freshwater aquifers. Petroleum products and other chemicals could result in groundwater contamination through a variety of operational sources, including but not limited to, pipeline and well casing failure, well (O&G and water)

construction, and spills. Similarly, improper construction and management of reserve and evaporation pits could degrade groundwater quality through leakage and leaching. The potential for negative impacts to groundwater caused from HF, are currently being investigated by the EPA as well as other state agencies, non-governmental organizations, and academic institutions in parts of the country where HF is more prevalent. Authorization of future proposed projects would require full compliance with local, state, and federal directives and stipulations that relate to surface and groundwater protection.

If contamination of freshwater aquifers from O&G development occurs, changes in groundwater quality could impact springs or groundwater wells if the springs and wells are sourced from the same aquifers that have been affected. Direct impacts to groundwater would likely be greatest shortly after the start of construction activities and would likely decrease in time due to natural attenuation and permit required remediation efforts. Impacts to groundwater would be less likely to occur on a longer time scale.

Spills or produced fluids (e.g., saltwater, oil, HF chemicals, and/or condensate in the event of a breach, overflow, or spill from storage tanks) could result in contamination of the soil onsite, or offsite, and may potentially impact surface and groundwater resources in the long term. Additional discussion of surface spills and releases is included above in Section 4.7.

Not all wells resulting from APD's would employ HF, and if HF were used, water consumption would be temporary. Currently, water used to drill and fracture one well ranges between 1,000,000 gallons to 8,000,000 gallons. During the HF process, chemical additives constitute up to 1-5% of the HF fluid. This translates to a minimum of 5,000 gallons of chemicals for every 1.5 million gallons of water used to fracture a well (Paschke 2011), or at least 26,000 gallons of additive for an O&G well requiring 8,000,000 gallons of water for HF activities.

4.8.2 Recommended Mitigation

To reduce threats to water quality and quantity, it is recommended that the following stipulation:

Water Quality (surface and ground)

As exploration and development activities commence, the operator shall institute a hydrologic monitoring program. The details of the monitoring programs will be site specific and the intensity shall be commensurate with the level of exploration. For example, if the proponent will be conducting seismic studies, the monitoring will be limited to the identification of water resources to be monitored as activities continue; if a drilling program were to be undertaken the number of aquifers encountered, their properties, their quality, and their saturated thickness will be documented. The information collected will be submitted to the BLM and will be used to support future NEPA documentation as development progresses. Adverse impacts to surface expressions of a geothermal reservoir (hot springs), and threatened and endangered species habitat are not acceptable. The lessee will monitor the quality, quantity, and temperature of any hot or cold springs or other water resource within the Project Area whenever they are conducting activities which have the potential to impact those resources. This may require the operator to make a good faith effort to obtain access across private property. If adverse

impacts do occur, BLM will require the lessee to take corrective action to mitigate the impact. Corrective action may include shutting down the operation. These are in addition to the other stipulations. The information gathered under the monitoring stipulation will be used to identify future impacts at the operational stage.

would be added to the terms and conditions of all the lease parcels in the Proposed Action.

4.8.3 No Action Alternative

The No Action Alternative would not authorize the proposed parcels for lease sale and the possible subsequent exploration or production activities and reclamation would not occur. No effects to surface water or groundwater quality and quantity would be expected to occur from O&G leasing. Permitted mining and geothermal activities, and authorized ROWs in the vicinity of the nominated lease parcels have had surface water and groundwater impacts analyzed as part of the permitting process. The impacts of these activities would continue as disclosed in their NEPA documentation.

4.9 Wetlands and Riparian

4.9.1 Proposed Action

In general, the activities related to HF would have identical impacts to wetlands and riparian areas as those described under traditional exploration and drilling activities. The exception is related to the potential impacts to ground and surface water quality described above in Section 4.8. Degradation of the water quality that supports wetlands and riparian zones can lead to mortality of or decreased health of flora and fauna that comprise or depend upon the wetland or riparian habitat.

4.9.2 Recommended Mitigation

To reduce direct and indirect impacts to wetlands and riparian areas, the following stipulation:

No Surface Occupancy: Surface occupancy will not be allowed within 650 feet (horizontal measurement) of any surface water bodies, riparian areas, wetlands, playas or 100-year floodplains to protect the integrity of these resources (as indicated by the presence of riparian vegetation and not actual water). Exceptions to this restriction may be considered on a case-by-case basis if the BLM determines at least one of the following conditions apply: 1) additional development is proposed in an area where current development has shown no adverse impacts, 2) suitable off-site mitigation will be provided if habitat loss is expected, or 3) BLM determines development proposed under any plan of operations ensures adequate protection of the resources. This buffer may be greater as determined by the WD, in order to sufficiently protect riparian areas against adverse impacts such as increased sedimentation, impacts to water quality and quantity and loss of riparian vegetation.

would be added to the terms and conditions of the following lease parcels due to the presence of an NHD mapped playa.

NV-14-09-021

T28N, R35E, Section 2, Lot 1, SENE, SESE
T28N, R35E, Section 12 ALL

NV-14-09-023

T29N, R35E, Section 36, W2, SE, W2NE

NV-14-09-034

T28N, R36E, Section 6 ALL
T28N, R36E, Section 8, W2, SE, S2NE

NV-14-09-035

T28N, R36E, Section 18 ALL
T28N, R36E, Section 30 ALL

NV-14-09-038

T29N, R36E, Section 32, W2SW

Additionally, this stipulation would apply to portions of any parcels containing wetlands identified in existing or future wetland delineations.

4.9.3 No Action Alternative

The No Action Alternative would not authorize the proposed parcels for lease sale and the possible subsequent exploration or production activities and reclamation would not occur. No effects to wetlands and riparian zones would be expected from O&G development. Current activities such as grazing have minimal impact to wetlands, and the current ROWs are already in place and permitted.

4.10 Geology and Minerals

4.10.1 Proposed Action

There would be no direct effects from issuing new O&G leases because leasing does not directly authorize O&G exploration and development activities. Direct impacts from these activities would be analyzed under a separate site-specific NEPA analysis. The RFD scenario discloses indirect future or potential impacts that could occur once the parcels are leased.

No known impacts would occur to the surface geology of the area. HF activities should not impact the subsurface geology except for opening existing fractures and/or creating new fractures to allow hydrocarbons to more readily flow into the wellbore. Induced seismicity in the area of direct and indirect impacts are of low probability, particularly because the wastewater injection sites are located outside of the WD. No other mineral resources would be affected by the Proposed Action.

O&G activities within the mining claim areas would have to be coordinated with the claimant according to the Multiple Minerals Development Act of 1954 and subsequent amendments (30 USC 521–531).

4.10.2 Recommended Mitigation

It is recommended that the following stipulation:

Contingency Rights Stipulation

The BLM has reviewed existing information and planning documents and, except as noted in other attached stipulations, knows of no reason why normal development—subject to the controls of applicable laws and regulations and the lease terms and conditions—cannot proceed on the leased lands. However, specific development activities could not be identified prior to lease issuance since the nature and extent of O&G resources were not known and specific operations have not been proposed. The lessee is hereby made aware that all post lease operations will be subject to appropriate environmental review and may be limited or denied by no surface occupancy stipulations.

would be added to the terms and conditions of all the lease parcels in the Proposed Action.

4.10.3 No Action Alternative

There would be no direct or indirect impacts to geology and minerals from O&G development under the No Action Alternative. Mining claimants could proceed with activities conducted under a mining Notice or Plan of Operations.

4.11 Lands and Realty

4.11.1 Proposed Action

Leasing creates a valid existing right, which would have a direct effect on current and future land-use authorizations. HF has no direct impacts on Lands and Realty, as the impacts come from the development of the lease.

When considering the RFD scenario, impacts could occur to existing utility ROWs and roads if all or some areas are opened for O&G exploration and leasing. Existing ROWs may need to be relocated (at the expense of the O&G lessee) to accommodate development of the resources. Granting of new ROWs for non-O&G development would need to take into consideration existing O&G leases. No other impacts to land use or realty are expected to occur.

4.11.2 Recommended Mitigation

To address ROWs and existing leases, it is recommended that the following stipulations:

Lands & Realty

The operator shall coordinate its lease activities with the existing rights-of-way holders in the lease area to avoid the potential for adverse effects on, and minimize the inconvenience to, these rights holders' authorized operations.

No drilling, including exploration or development activities, will be allowed within a linear R/W's authorized footprint.

O&G lessees and operators shall not prevent public access across leased lands.

would be added to the terms and conditions of all the lease parcels in the Proposed Action.

4.11.3 No Action Alternative

There would be no direct or indirect impacts to Lands and Realty from O&G development under the No Action Alternative. Utility companies and others could seek ROWs free from constraints due to O&G leasing.

4.12 Special Status Species

4.12.1 Proposed Action

There would be no direct effects to special status species from issuing new O&G leases because leasing does not directly authorize O&G exploration and development activities. Direct and indirect impacts from these activities would be analyzed under a separate site-specific NEPA analysis. HF fluids could pose impacts to special status species depending on the chemistry of the fluids.

O&G development could affect special status species in a variety of direct and indirect ways. While a substantial amount of additional work is necessary to determine the distribution and demography of populations that could be affected by the Proposed Action, information gathered from other O&G developments and knowledge of the environmental consequences of habitat alteration and pollutants provides sufficient information to assess potential impacts. Potential impacts are summarized below, but a more thorough analysis of how special status species would be affected by activities associated with O&G development would be assessed during site-specific EAs that would be prepared for each action.

Environmental effects of O&G resource development are similar to other activities affecting terrestrial habitat, and surface and groundwater. While each species would respond differently to various impacts, all of them could be affected by activities that alter the thermal, physical, or chemical characteristics of their habitats. Physical habitat alteration could result from on-site facility construction, road and power line construction. Impacts of groundwater removal could affect spring and stream discharge (which could modify physical, chemical, and thermal characteristics of aquatic habitats), and alter the thermal characteristics of soils. Surface discharge of thermal waters could also affect chemical and thermal characteristics of habitats that are important to terrestrial and aquatic communities.

Indirect effects are largely attributed to increased human activity, which could displace individuals or reduce breeding success of species that are sensitive to disturbance. Road construction could also increase access into areas that are currently remote and provide for additional legal and illegal take.

Species associated with larger aquatic habitats (e.g., aquatic, marshland, and riparian species) could be adversely affected by increased activity in riparian systems (e.g., road construction, disturbances that increase erosion, etc.) and by changes in water quality that could be associated with surface release of petroleum-contaminated water or construction materials. Spring-dwelling species could also be affected by these factors in addition to alterations in discharge and thermal characteristics that could occur with groundwater removal. Some small and immobile species could suffer direct mortality due to construction activities.

4.12.2 Recommended Mitigation

To prevent or reduce the threats to special status species, the *Controlled Or Limited Surface Use* stipulation identified in Section 4.6.2 above would be brought forward for special status species. The stipulation would be added to the terms and conditions of all the lease parcels in the Proposed Action.

4.12.3 No Action Alternative

The No Action Alternative would not authorize the proposed parcels for lease sale and the possible subsequent exploration or production activities and reclamation would not occur. As a result, no impacts to special status species would be expected from O&G development.

4.13 Vegetation

4.13.1 Proposed Action

There would be no direct impacts to vegetation from issuing O&G leases. Direct impacts would occur in the exploration and development phases. When considering the RFD scenario, there could be impacts to vegetation resources in the short-term due to operational activity and construction. Long-term impacts to vegetation resources could occur due to upgrading of roads and the change in type of vegetation in areas that are reclaimed. Adverse impacts to vegetation from the various phases of O&G development include crushing or removal of vegetation and changing vegetation composition. Changes in vegetation due to construction could result in the introduction of weedy annual species and pioneering shrub species that would persist with continued disturbance and lack of maintenance.

Section 4.12.1 of the 2005 O&G EA summarizes the impacts from the RFD actions associated with O&G exploration and development. HF would not create new direct or indirect impacts to vegetation. In exploration, impacts would be considered short-term and localized. The greatest environmental impact on vegetation is expected to occur during the development phase. Impacts on vegetation during the development phase would be considered minor and localized. Damage to vegetation from pipeline corridors is not as severe as from drilling pads. Seeding disturbed areas would reduce adverse impacts to vegetation.

4.13.2 Recommended Mitigation

To reduce direct and indirect impacts to vegetation, the following stipulation:

Vegetation

All areas of exploration and or development disturbance will be reclaimed including re-contouring disturbed areas to blend with the surrounding topography and using appropriate methods to seed with a diverse perennial seed mix. The seed mix used to reclaim disturbed areas will be “certified” weed free.

would be added to the terms and conditions of all the lease parcels in the Proposed Action.

4.13.3 No Action Alternative

The No Action Alternative would not impact vegetation in the assessment area. Grazing and travel along ROWs could still produce minor impacts to vegetation.

4.14 Wild Horse and Burro

4.14.1 Proposed Action

Direct impacts to wild horses in the Humboldt HA would not occur due to O&G leasing. Indirect impacts may result from exploration activities, well drilling and development/production that occurred within the HA in the short-term. Should exploration or development be proposed within these leased areas, additional, site specific NEPA analysis would be completed to assess the potential impacts to wild horses.

Direct impacts from exploration and development on wild horses could include disturbance due to increased human activity. These impacts would likely be short-term in nature, and would consist of wild horses moving out of the area or changing movement patterns. The degree of disturbance to wild horses would be equivalent to the levels of exploration/development and increased activity in the area. Development activities have the potential to block access to water and forage. Through the NEPA analysis for specific projects, BMPs and stipulations would be developed to reduce potential impacts to wild horses. HF fluids could pose indirect impacts to wild horses.

4.14.2 Recommended Mitigation

To reduce direct and indirect impacts to wild horses, the following stipulation:

Controlled or Limited Surface Use: (avoidance and/or mitigation measures to be developed.) If wild horse or burro populations are located on sites proposed for development, it may be necessary to avoid or develop mitigation measures to reduce adverse impacts to horses. These measures may include providing alternative water sources for horses of equal quality and quantity. In the Stillwater HMA any alternate water source shall be placed one mile away from O&G operations.

would be added to the terms and conditions of all the lease parcels in the Proposed Action.

4.14.3 No Action Alternative

Under the No Action Alternative, no O&G leases would be sold; therefore, there would be no impacts to wild horses from O&G development.

4.15 Wildlife

4.15.1 Proposed Action

There would be no direct effects to wildlife from issuing new O&G leases because leasing does not directly authorize O&G exploration and development activities. Direct impacts from these activities would be analyzed under a separate site-specific NEPA analysis. The RFD scenario discloses indirect future or potential impacts that could occur once the parcels are leased. HF fluids could pose impacts to wildlife depending on the chemistry of the fluids.

Environmental effects of O&G resource development are similar to other activities affecting terrestrial habitat, and surface and groundwater. While each species would respond differently to various impacts, all of them could be affected by activities that alter the thermal, physical, or chemical characteristics of their habitats. Physical habitat alteration could result from on-site facility construction, road and power line construction. Impacts of groundwater removal could affect spring and stream discharge (which could modify physical, chemical, and thermal characteristics of aquatic habitats), and alter the thermal characteristics of soils. Surface discharge of thermal waters could also affect chemical and thermal characteristics of habitats that are important to terrestrial and aquatic communities. In addition, O&G development at various stages could disrupt big game movement corridors.

Indirect effects are largely attributed to increased human activity, which could displace individuals or reduce breeding success of species that are sensitive to disturbance. Road construction could also increase access into areas that are currently remote and provide for additional legal and illegal take.

Species associated with larger aquatic habitats (e.g., aquatic, marshland, and riparian species) could be adversely affected by increased activity in riparian systems (e.g., road construction, disturbances that increase erosion, etc.) and by changes in water quality that could be associated with surface release of oil and gas water or construction materials. Spring-dwelling species could also be affected by these factors in addition to alterations in discharge and thermal characteristics that could occur with groundwater removal. Some small and immobile species could suffer direct mortality due to construction activities.

4.15.2 Recommended Mitigation

The stipulations for migratory birds, threatened and endangered species, and special status species would also provide protections to general wildlife. Specific mitigation would be developed for wildlife for a specific O&G exploration and/or development proposal. There are no additional recommended mitigations at this time.

4.15.3 No Action Alternative

The No Action Alternative would not authorize the proposed parcels for lease sale and the possible subsequent exploration or production activities and reclamation would not occur. As a result, no impacts to wildlife would be expected.

4.16 Cumulative Impacts

The Council on Environmental Quality (CEQ) regulations that implement NEPA define a cumulative impact as: “The impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions.” Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

4.16.1 Assumptions for Cumulative Analysis

For the purposes of this analysis, the Cumulative Effects Study Area (CESA) outlined in, includes all public and private lands in the Buena Vista Valley Hydrographic Basin. This CESA is being used for all affected resources in **Table 3-1** and **Table 3-2**. The CESA area consists of approximately 471,145 acres of which about 345,151 acres are public lands, and 125,994 acres are private lands (**Figure 3**).

This EA evaluates the impact of the O&G lease sale when added to other past, present, and reasonably foreseeable actions. Past actions have been aggregated in order to describe the impact of historic activities on the existing environment. It needs to be stressed that these past activities have created the existing environment; the CEQ explicitly does not require that all past and present actions be individually described since the impacts of these actions are represented in the existing environment (CEQ 2005). Consistent with CEQ guidance, the Ninth Circuit has held that an agency may aggregate its cumulative effects analysis of past projects, and in doing so, satisfies the “hard look” standard (League of Wilderness Defenders 2010).

For this EA, past actions that have been attributed to disturbances in this cumulative impacts assessment area are: energy and mining projects; livestock grazing; grazing by wild horse and burros; ROWS; introduction of non-native/invasive plants; dispersed tree cutting; Department of Defense (DD) flights; and wildfires.

4.16.2 Past and Present Actions

On the basis of aerial photographic data, LR2000 database reports ran in March 2014, agency records and current agency GIS records and analysis, the following past and present actions, which have impacted the CESA to varying degrees, have been identified:

- Energy projects include the New York Canyon Exploration and Development Plans, and geothermal lease sales. The New York Canyon project is permitted to disturb approximately 350 acres for their permitted development. Only limited geothermal drilling has been conducted to date in the CESA, there have been numerous geophysical surveys performed in the CESA.

- Mining projects include several claims in the CESA with Notice-level work occurring on some of them. Historic mining has been conducted in the CESA since the late 1800s. Larger mines operating in the CESA include the Coeur Rochester mine, the Fencemaker Antimony Mine, and the Relief Canyon Mine.
- Livestock grazing has occurred since the late nineteenth century in the CESA. The allotments covered in this EA include the Klondike, Rawhide and Star Peak Allotments. Total acreage for these three allotments is approximately 441,881 acres with a total active animal unit months of 10,425.
- The CESA includes the Humboldt HA and a portion of the North Stillwater HMA. Approximately 185 wild horses are in the Humboldt HA, and 370 wild horses are in the HMA. Wild horses forage primarily on herbaceous grasses and forbs and less on shrub species.
- Several ROWs have been granted on public lands within the CESA. These include ROWs for transmission lines, telephone lines, fiber optic cables, and irrigation.
- Cheatgrass and other invasive species have been spread from ground disturbing activities such as mining, road construction, and over-grazing.
- The BLM permits annual Christmas tree cutting in the Stillwater Range. Part of the western slope of the Stillwater Range is in the CESA.
- The DD conducts supersonic and sub-sonic flights over the CESA.
- The BLM has fire history GIS data available from 1980 through 2013. Between 1999 and 2011, approximately 57,936 acres of the CESA have burned.
- Aerial imagery shows up to 26 existing areas which may be subject to pivot irrigation and an additional four irregularly shaped areas which are subject to some other form of irrigation.

4.16.3 Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions (RFFAs) are those actions that are known or could reasonably be anticipated to occur within the study area and within a time frame appropriate to the expected impacts from the Proposed Action. For the O&G lease sale, the time frame for potential future actions is assumed to be 10 years. The following RFFAs were identified during internal scoping:

- While geothermal and O&G leases exist within the CESA, no new exploration or development plans have been submitted to the BLM.
- Coeur Rochester Mine has submitted a Plan of Operations to expand operations within their current Plan Boundary. Relief Canyon Mine has notified the BLM that they would like to resume mining operations in the existing pits, and in the near future seek approval to expand the pits.
- Livestock grazing will continue to occur in the CESA and the grazing permit renewals will be analyzed when they come due.
- A wild horse gather is proposed for the Humboldt HA when space becomes available in holding facilities. If implemented, the goal of the gather is to remove all wild horses from the Humboldt HA.
- The DD will continue to conduct flights over the CESA. Travis Air Force Base is proposing to initiate low-level navigation training for C-17 aircrews on routes which cross the CESA (Department of Air Force 2012). This proposal would involve

approximately 111 flights a year at an altitude of approximately 300 feet above ground level.

- Wildfires are expected to continue to burn, particularly with the climate becoming warmer and drier. The acreage burnt in each future fire is an unknown.

4.16.4 Cumulative Impacts to Affected Resources

Impacts associated with past, present, and RFFAs are generally created by ground or vegetation-disturbing activities that affect natural and cultural resources in various ways. Of particular concern is the *accumulation* of these impacts over time. This section of the EA considers the nature of the cumulative effect and analyzes the degree to which the Proposed Action and alternatives contribute to the collective impact.

4.16.4.1 Air Quality

Impacts from Past and Present Actions

Past actions within the CESA do not have an effect on air quality within the CESA beyond a few days since winds are generally moving air through the area and changing air quality conditions. At any given moment in time, active mining and/or active wildfires would have a negative impact on air quality within the CESA. Vehicular traffic, farming equipment, and aircraft flying in the CESA add pollutants to the air.

Impacts from RFFAs

Continued mining, vehicular traffic and military flights would continue to add pollutants to the air within the CESA. Wildfires would also when they occur. Proposed mine expansion at Coeur Rochester mine, and re-starting mining operations at Relief Canyon, could increase the release of mercury, GHGs, CO, NO₂, SO₂, PM₁₀ and PM_{2.5}.

Cumulative Impacts of the Proposed Action

The lease sale itself would not result in an increase in the release of any pollutants or GHGs within the CESA. Exploration and production could increase the release of pollutants and GHGs. Whether they would be significant is uncertain at this time, since the specific technology used for exploration and development is unknown at this time.

Cumulative Impacts of the No Action Alternative

The No Action Alternative would make no contribution to cumulative impacts.

4.16.4.2 Cultural Resources

Impacts from Past and Present Actions

The integrity of cultural resources eligible for the NRHP have been affected directly and indirectly by energy development, grazing, mining, ROWs, and wildfires. For proponent or BLM based projects, the direct impacts were mitigated in accordance with the NHPA.

Impacts from RFFAs

All of the past and present actions described above are expected to continue within the CESA. These actions are expected to continue to affect the integrity of NRHP eligible cultural resources within the CESA.

Cumulative Impacts of the Proposed Action

The lease sale itself would not result in an increase of impacts to cultural resources within the CESA. Exploration and production could increase the direct impacts to NRHP eligible sites.

Cumulative Impacts of the No Action Alternative

The No Action Alternative would make no contribution to cumulative impacts.

4.16.4.3 Invasive and Non-Native Species

Impacts from Past and Present Actions

Past and present actions from grazing, mining, ROWs, and fires have created surface disturbances that have facilitated the establishment and spread of invasive and non-native plant species in the CESA.

Impacts from the RFFAs

Impacts from past and present actions would likely continue under the RFFAs. Expanded mining and grazing operations could favor the expansion of invasive and non-native plant species. In addition, climate change may favor invasive plants, since they are generally more tolerant to a wider range of conditions, than are native plants (EPA 2011).

Cumulative Impacts of the Proposed Action

The O&G lease sale will not directly promote the spread of invasive and non-native plants. Exploration and development have the potential to remove and degrade habitat, and help foster the growth of invasive and non-native plants. Re-seeding and reclamation of disturbed areas could re-establish habitat.

Cumulative Impacts of the No-Action Alternative

The No Action Alternative would make no contribution to cumulative effects.

4.16.4.4 Migratory Birds (also includes Threatened and Endangered Species, Special Status Species, and Wildlife)

The cumulative impacts to migratory birds, threatened and endangered species, special status species, and wildlife are all similar.

Impacts from Past and Present Actions

Wildlife, special status species, and their habitats have been impacted through wildfire and various multiple uses such as livestock grazing, lands and realty, mining, recreation, wild horses, and associated roads and trails. Human activities have also increased the introduction and spread of weeds.

Livestock and wild horses continue to utilize vegetation and impact riparian vegetation, soils and water quality. These impacts can be especially pronounced during times of below average precipitation. Forage and water availability can become limited, and negatively affect wildlife health and fitness. The impacts to the important riparian and stream habitats from these past and present actions, in general, include: loss of streamside vegetation, increased sedimentation, increased stream channel width, and loss of undercut stream bank habitat.

Rangeland management projects, such as fences and water developments have been installed over the last several decades and continue to be used and maintained for the purpose of livestock grazing management. The use of fencing can help reduce adverse impacts to habitat from livestock, wild horse and human use. They can also allow implementation of livestock grazing systems which have a beneficial impact to wildlife habitat by providing periodic rest from grazing. Negative impacts can result from injuries or death to wildlife from entanglement or from alteration of natural movement. Fences may also provide unnatural, advantageous perch sites for avian predators.

Additional water sources can increase populations by providing water where it would not naturally occur. This may be beneficial to some species and detrimental to others. For instance, insect numbers may increase and provide a greater abundance of food for birds and bats but may also increase the incidence of disease (e.g. West Nile virus) transmission to some species of wildlife.

Realty and mining actions have added to impacts to wildlife through authorization of access and permitting of structures and activities in the assessment area. Such actions result in more human activity, noise, and disturbance to wildlife habitat. Development within the assessment area has resulted in habitat fragmentation since some species are reluctant to go near or cross roads or trails.

Recreation activities affect wildlife in similar ways as realty actions. Cross-country OHV use in addition to use of existing trails, can injure wildlife, disrupt their activities, disturb soil and vegetation, and spread weeds.

Impacts from RFFAs

Impacts from livestock grazing and range improvement projects are expected to remain at the current level.

The future realty and mining actions within the CESA would result in additional noise, fragmentation and disturbance to wildlife and habitat. Recreational activities are expected to increase in the future, resulting in a proportionate increase of impacts as described under impacts from past and present actions.

Cumulative Impacts of the Proposed Action

Cumulative affects to wildlife, special status species, and their habitat have resulted from past and present actions within the cumulative assessment area as a result of direct surface disturbance, grazing and the indirect effects of noise and general human activity. Temporary, localized displacements and sometimes destruction of wildlife have also occurred during ground disturbing activities. O&G leasing itself will not impact wildlife. Overall, cumulative impacts to wildlife, special status species, and their habitat from potential exploration and development would be low if stipulations are developed through the course of the NEPA analysis of the exploration and/or development project.

Cumulative Impacts of the No-Action Alternative

Negative direct impacts such as disturbance and possible injury to birds, special status species and wildlife would not occur under this alternative; therefore, resulting in less cumulative negative impacts than the Proposed Action.

4.16.4.5 Native American Religious Concerns

Impacts from Past and Present Actions

From contacts with settlers, disease and alcohol have decimated the Northern Paiutes and Western Shoshone populations. Past historical actions in the CESA, including mining and mineral extraction, have served to drive the Northern Paiutes off the land and confine them to reservations. Only in the past 50 years, through legislation, has an attempt been made by federal and state governments to undo some of these actions.

Impacts from RFFAs

All the past and present actions described above are expected to continue within the CESA and are expected to affect the areas of Native American concern. The low level military flights as proposed by Travis Air Force Base would result in periodic, short bursts of loud noise over the TCPs in the Stillwater Range.

Cumulative Impacts of the Proposed Action

O&G leasing would not produce any direct effects to Native American concerns. Exploration and

development activities could possibly impact TCPs, but given the distance from the known TCPs, this is not believed to be a major concern. RFDs would be analyzed under future NEPA documents, and any impacts would need to be mitigated.

Cumulative Impacts of the No-Action Alternative

Under the No Action Alternative, no additional cumulative effects would occur.

4.16.4.6 Threatened and Endangered Species

See Section 4.16.4.4 for cumulative effects to threatened and endangered species.

4.16.4.7 Wastes, Hazardous and Solid

Impacts from Past and Present Actions

Public dumping, mining and geothermal exploration have introduced and continue to introduce wastes into the CESA. This increases the risk for spills and contamination of soils and groundwater.

Impacts from RFFAs

The past and present actions are expected to continue; thus, increasing risk for soil and groundwater contamination.

Cumulative Impacts of the Proposed Action

While O&G leasing does not directly generate solid waste and/or hazardous materials, exploration and development has the potential to generate these materials. Solid waste and hazardous materials would be transported, stored, and used as part of the RFD. Depending on the duration and extent of the operation, the risk of contamination and volume of solid waste would range from low to moderate. NEPA analysis of any future exploration or development would be needed to analyze the risk of contamination and volume of waste generated; plus, develop any necessary stipulations needed to mitigate any impacts.

Cumulative Impacts of the No-Action Alternative

The No Action Alternative would make no contribution to cumulative impacts.

4.16.4.8 Water Quality (including Quantity)

Impacts from Past and Present Actions

Geothermal exploration and mining may have caused changes in water quality and quantity in the CESA. After regulations were put into place, all operations must adhere to permit conditions which are intended to reduce any impacts. Irrigation, which uses the largest volume of water

permitted by the NDWR, has the largest impact on legal water availability (quantity), though there is no evidence that this use has caused any measurable impact to groundwater levels.

Impacts from RFFAs

The potential for impacts from the past and present actions identified above would likely continue under the RFFAs. Any impacts would be minimized through permit conditions by the BLM and State of Nevada.

Cumulative Impacts of the Proposed Action

O&G leasing itself has no direct impact on water quality and quantity. The RFD scenarios may have potential to impact water quality and quantity. The specific impacts would be analyzed under a new NEPA document that focuses on the exploration and/or development proposal. Drilling and well construction would be conducted in accordance with state and federal regulations. BMPs and stipulations would be developed to prevent drilling fluids from impacting groundwater. As noted in Section 4.8, there is a remote possibility of HF fluids contaminating groundwater. HF would also require a large volume of water. As a result, the effects from HF have the potential to be additive to the effects to water quality and water quantity from past, present, and RFFAs. Additional NEPA analysis would determine if this incremental addition is significant or not.

Cumulative Impacts of the No-Action Alternative

The No Action Alternative would make no contribution to cumulative impacts.

4.16.4.9 Wetlands and Riparian

Impacts from Past and Present Actions

Geothermal exploration and mining may have caused changes in water quality and quantity in the CESA. After regulations were put into place, all operations must adhere to permit conditions which are intended to reduce any impacts.

Impacts from RFFAs

The potential for impacts from the past and present actions identified above would likely continue under the RFFAs. Any impacts would be minimized through permit conditions by the BLM and State of Nevada.

Cumulative Impacts of the Proposed Action

While O&G leasing would have no direct impact on wetlands/riparian zones, exploration and development could adversely impact groundwater sources which sustain wetlands and riparian zones. HF fluids are potential contaminants. The risks of adverse impacts would have to be analyzed in specific NEPA documents for RFD actions; stipulations to minimize impacts would be developed in the course of future NEPA analysis. Any effects to wetlands and riparian zones

from HF would be additive to any effects from past, present, and RFFAs.

Cumulative Impacts of the No-Action Alternative

The No Action Alternative would make no contribution to cumulative impacts.

4.16.4.10 Geology and Minerals

Impacts from Past and Present Actions

Historic and contemporary mining have been occurring throughout the CESA. Before regulations were put into place, historic mining has often left impacts to vegetation and wildlife. Abandoned mines pose a public health and safety threat. Contemporary mines are operated in accordance with all federal, state and local guidelines.

Impacts from RFFAs

The NEPA level of Coeur Rochester's mine expansion will be an Environmental Impact Statement. This automatically implies that there will be impacts to the human environment. With the analysis only beginning on Coeur Rochester's Plan of Operations, it is uncertain as to the extent of those impacts.

Cumulative Impacts of the Proposed Action

There are active mining claims throughout the CESA and in some of the proposed lease parcels. It is possible that RFD scenarios could occur on mining claims while claimants are trying to work their claims. Should an O&G lessee want to drill on a claim, they would have to coordinate with the claimant. O&G leasing is not seen as impacting mining. O&G leasing is not seen as creating impacts to mining resources; RFD scenarios would be evaluated in separate NEPA documents.

Cumulative Impacts of the No-Action Alternative

There would be no cumulative impacts from the No Action alternative.

4.16.4.11 Lands and Realty

Impacts from Past and Present Actions

Since 1976, all past and present actions have been in accordance with FLPMA and other relevant BLM land use plans.

Impacts from RFFAs

RFFAs are expected to be consistent with FLPMA and BLM land use planning.

Cumulative Impacts of the Proposed Action

O&G leasing is consistent with BLM land use plans. RFDs in the leases would be analyzed under NEPA to insure they are in compliance with FLPMA and applicable land use plans. The O&G lessee would have to coordinate with the ROW holder.

Cumulative Impacts of the No-Action Alternative

The No Action Alternative would make no contribution to cumulative impacts.

4.16.4.12 Special Status Species

See Section 4.16.4.4 for cumulative effects to special status species.

4.16.4.13 Vegetation

Impacts from Past and Present Actions

Past and present actions within the CESA has created ground disturbance which has killed native vegetation and helped foster the growth of invasive plant species in some locations.

Impacts from RFFAs

All of the past, present and RFFAs within the cumulative effects area have increased the potential for the impacts to vegetation from surface disturbing actions. The amount of surface disturbance within the assessment area is increasing and will continue to do so. Measures to minimize the area of new surface disturbance and require the implementation of BMPs and reclamation where feasible and reasonable will help to reduce cumulative impacts.

Cumulative Impacts of the Proposed Action

O&G leasing does not directly impact vegetation in the project area. RFD scenarios do have the potential to impact vegetation; the extent and duration would depend on the future proposal. Any RFD scenario would require analysis under NEPA; stipulations would be developed through the course of future analysis to minimize impacts.

Cumulative Impacts of the No Action Alternative

The No Action Alternative would make no contribution to cumulative impacts.

4.16.4.14 Wild Horse and Burro

Impacts from Past and Present Actions

Mining and geothermal exploration have had impacts on wild horses through noise and visual disturbance; from removing vegetation that would otherwise be available for grazing; and by constructing barriers to wild horse movements. Fires have also removed forage.

Impacts from RFFAs

Other than the Humboldt HA Horse Gather, the RFFAs will reduce forage for wild horses and create barriers to their movements inside the CESA.

Cumulative Impacts of the Proposed Action

O&G leasing itself will not directly impact wild horse populations. Further, the Proposed Action is in the Humboldt HA, where the BLM does not manage wild horses. Human activity and noise from the RFD scenarios could temporarily displace wild horses. Drilling and production facilities could remove vegetation and disrupt movement patterns. Specific impacts would be analyzed in future NEPA documents for specific exploration and development programs.

Cumulative Impacts of the No Action Alternative

The No Action Alternative would make no contribution to cumulative impacts.

4.16.4.15 Wildlife

See Section 4.16.4.4 for cumulative effects to wildlife.

5.0 RECOMMENDED MITIGATION AND MONITORING

The following mitigation measures have been proposed for the Proposed Action.

5.1 Air Quality

There are no specific stipulations applicable for O&G leasing. Any exploration or development on an O&G lease would require separate NEPA and stipulations could be applied at that time.

5.2 Cultural Resources

All subsequent activities on leased parcels shall be subject to Section 106 of the NHPA and further NEPA study. The following stipulation developed in the 2005 O&G EA:

Controlled Or Limited Surface Use: (avoidance and/or mitigation measures to be developed). All surface disturbing activities proposed after issuance of the lease are subject to compliance with Section 106 of the National Historic Protection Act (NHPA) and its implementation through the protocol between the BLM Nevada State Director and the Nevada State Historic Preservation Officer.

would be added to the terms and conditions of all the lease parcels in the Proposed Action.

5.3 Invasive and Non-Native Species

To reduce the threat of invasive and noxious weeds, the following stipulation:

Invasive, Non-Native Species

During all phases of exploration and development, the lessee shall maintain a noxious weed control program consisting of monitoring and eradication for species listed on the Nevada Designated Noxious Weed List (NRS 555.010).

Areas to be developed will be inventoried for the presence of invasive nonnative species before disturbance. During close out operations, sites shall be inventoried for the presence of these species and treated if weeds are present.

The BLM will develop and the operator will implement a weed treatment program from the time operation commences until the site is abandoned. Seed and mulch used to reclaim disturbed areas shall be free of invasive non-native species

would be added to the terms and conditions of all the lease parcels in the Proposed Action.

5.4 Migratory Birds

To reduce the threats to migratory birds, the following stipulation:

Migratory Birds

Surface disturbing activities during the migratory bird nesting season (March to July) may be restricted in order to avoid potential violation of the Migratory Bird Act. Appropriate inventories of migratory birds shall be conducted during analysis of actual site development. If active nests are located, or if other evidence of nesting is observed (mating pairs, territorial defense, carrying of nesting material, transporting of food), the proponent shall coordinate with BLM to establish appropriate protection measures for the nesting sites. Protection measures may include avoidance or restricting or excluding development in certain areas until nests and nesting birds will not be disturbed. After July 31, no further avian survey, will be conducted until the following year. During development and production phases, if artificial ponds potentially detrimental to migratory birds are created, these shall be fitted with exclusion devices such as netting or floating balls.

would be added to the terms and conditions of all the lease parcels in the Proposed Action.

5.5 Native American Religious Concerns

To reduce the impacts to the unevaluated Kyle Hot Springs TCP and any other potential TCPs, the following stipulation:

Controlled or Limited Surface Use: (avoidance and/or mitigation measures to be developed): For development and production phases, surface occupancy may be limited to a specific distance or precluded at hot springs, sacred sites, or TCPs pending conclusion of the Native American consultation process. All development activities proposed under the authority of this lease are subject to the requirement for Native American consultation prior to BLM authorizing the activity. Depending on the nature of the lease developments proposed and the resources potentially affected, Native American consultation and mitigation measures to avoid significant impacts could significantly extend time frames for processing authorizations for development activities and change the ways in which developments are implemented.

Native Americans shall be allowed to access to sacred sites and Traditional Cultural Properties on and through oil and gas leases. Access to Native American sacred sites and Traditional Cultural Properties shall not be precluded by oil and gas exploration and development activities.

Should previously unidentified human remains or funerary objects be discovered during surface disturbing activities, all surface disturbing activities in the immediate vicinity of the discovery shall cease and BLM shall be notified. Surface disturbing activities shall not be reinitiated in the immediate vicinity of the discovery until authorized by the BLM.

This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious

Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated.

As surface disturbing activities occur, the BLM will require that the operator monitor the water temperature and outflow of water from local hot springs and existing wells. This may require the operator to make a good faith effort to obtain access across private property. If the temperature and outflow of the water from the spring or well are impacted, the BLM will require the operator to take corrective actions. Failure of the operator to take the corrective measures as directed could result in BLM's terminating the operation.

would be added to the terms and conditions of all the lease parcels in the Proposed Action.

5.6 Threatened and Endangered Species

To reduce the threats to threatened and endangered species, the following stipulation:

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

Exploratory endeavors on the public lands will require a special status species review, and may require a field survey for the presence of special status species. Potential impacts to special status species will be analyzed on a case-by-case basis. Mitigation measures will be developed on an individual project basis depending upon the results of the survey.

would be added to the terms and conditions of all the lease parcels in the Proposed Action.

5.7 Wastes, Hazardous or Solid

To reduce the threat of hazardous and solid wastes, the following stipulation:

Hazardous Materials/Waste and Solid Waste

Prior to exploration and development, an approved emergency spill response plan will be developed to include contingencies for hazardous material and/or hazardous waste spills.

would be added to the terms and conditions of all the lease parcels in the Proposed Action.

5.8 Water Quality (including Quantity)

To reduce threats to water quality and quantity, it is recommended that the following stipulation:

Water Quality (surface and ground)

As exploration and development activities commence, the operator shall institute a hydrologic monitoring program. The details of the monitoring programs will be site specific and the intensity shall be commensurate with the level of exploration. For example, if the proponent will be conducting seismic studies, the monitoring will be limited to the identification of water resources to be monitored as activities continue; if a drilling program were to be undertaken the number of aquifers encountered, their properties, their quality, and their saturated thickness will be documented. The information collected will be submitted to the BLM and will be used to support future NEPA documentation as development progresses. Adverse impacts to surface expressions of a geothermal reservoir (hot springs), and threatened and endangered species habitat are not acceptable. The lessee will monitor the quality, quantity, and temperature of any hot or cold springs or other water resource within the Project Area whenever they are conducting activities which have the potential to impact those resources. This may require the operator to make a good faith effort to obtain access across private property. If adverse impacts do occur, BLM will require the lessee to take corrective action to mitigate the impact. Corrective action may include shutting down the operation. These are in addition to the other stipulations. The information gathered under the monitoring stipulation will be used to identify future impacts at the operational stage.

would be added to the terms and conditions of all the lease parcels in the Proposed Action.

5.9 Wetlands and Riparian

To reduce direct and indirect impacts to wetlands and riparian areas, the following stipulation:

No Surface Occupancy: Surface occupancy will not be allowed within 650 feet (horizontal measurement) of any surface water bodies, riparian areas, wetlands, playas or 100-year floodplains to protect the integrity of these resources (as indicated by the presence of riparian vegetation and not actual water). Exceptions

to this restriction may be considered on a case-by-case basis if the BLM determines at least one of the following conditions apply: 1) additional development is proposed in an area where current development has shown no adverse impacts, 2) suitable off-site mitigation will be provided if habitat loss is expected, or 3) BLM determines development proposed under any plan of operations ensures adequate protection of the resources. This buffer may be greater as determined by the WD, in order to sufficiently protect riparian areas against adverse impacts such as increased sedimentation, impacts to water quality and quantity and loss of riparian vegetation.

would be added to the terms and conditions of the following lease parcels due to the presence of an NHD mapped playa.

NV-14-09-021

T28N, R35E, Section 2, Lot 1, SENE, SESE

T28N, R35E, Section 12 ALL

NV-14-09-023

T29N, R35E, Section 36, W2, SE, W2NE

NV-14-09-034

T28N, R36E, Section 6 ALL

T28N, R36E, Section 8, W2, SE, S2NE

NV-14-09-035

T28N, R36E, Section 18 ALL

T28N, R36E, Section 30 ALL

NV-14-09-038

T29N, R36E, Section 32, W2SW

Additionally, this stipulation would apply to portions of any parcels containing wetlands identified in existing or future wetland delineations.

5.10 Geology and Minerals

It is recommended that the following stipulation:

Contingency Rights Stipulation

The BLM has reviewed existing information and planning documents and, except as noted in other attached stipulations, knows of no reason why normal development—subject to the controls of applicable laws and regulations and the lease terms and conditions—cannot proceed on the leased lands. However, specific development activities could not be identified prior to lease issuance since the nature and extent of O&G resources were not known and specific operations have not been proposed. The lessee is hereby made aware that all post

lease operations will be subject to appropriate environmental review and may be limited or denied by no surface occupancy stipulations.

would be added to the terms and conditions of all the lease parcels in the Proposed Action.

5.11 Lands and Realty

To address ROWs and existing leases, it is recommended that the following stipulations:

Lands & Realty

The operator shall coordinate its lease activities with the existing rights-of-way holders in the lease area to avoid the potential for adverse effects on, and minimize the inconvenience to, these rights holders' authorized operations.

No drilling, including exploration or development activities, will be allowed within a linear R/W's authorized footprint.

O&G lessees and operators shall not prevent public access across leased lands.

would be added to the terms and conditions of all the lease parcels in the Proposed Action.

5.12 Special Status Species

To prevent or reduce the threats to special status species, the *Controlled Or Limited Surface Use* stipulation identified in Section 4.6.2 above would be brought forward for special status species. The stipulation would be added to the terms and conditions of all the proposed lease parcels.

5.13 Vegetation

To reduce direct and indirect impacts to vegetation, the following stipulation:

Vegetation

All areas of exploration and or development disturbance will be reclaimed including re-contouring disturbed areas to blend with the surrounding topography and using appropriate methods to seed with a diverse perennial seed mix. The seed mix used to reclaim disturbed areas will be "certified" weed free.

would be added to the terms and conditions of all the lease parcels in the Proposed Action.

5.14 Wild Horse and Burro

To reduce direct and indirect impacts to wild horses, the following stipulation:

Controlled or Limited Surface Use: (avoidance and/or mitigation measures to be developed.) If wild horse or burro populations are located on sites proposed for development, it may be necessary to avoid or develop mitigation measures to reduce adverse impacts to horses. These measures may include providing

alternative water sources for horses of equal quality and quantity. In the Stillwater HMA any alternate water source shall be placed one mile away from O&G operations.

would be added to the terms and conditions of all the lease parcels in the Proposed Action.

5.15 Wildlife

The stipulations for migratory birds, threatened and endangered species, and special status species would also provide protections to general wildlife. Specific mitigation would be developed for wildlife for a specific O&G exploration and/or development proposal. There are no recommended mitigations at this time.

6.0 TRIBES, INDIVIDUALS, ORGANIZATIONS, OR AGENCIES CONSULTED

6.1 Native American Consultation

Letters requesting consultation were sent to the following tribes on March 4, 2014: Battle Mountain Band, Fallon Paiute Shoshone Tribe, Lovelock Paiute Tribe, Pyramid Lake Paiute Tribe, and the Winnemucca Indian Colony. On February 28, 2014, an informational meeting was held with the Fallon Paiute Shoshone Tribe.

6.2 Agency Coordination and/or Consultation

Agency consultation was used for the preparation of this EA. Agency consultation response references are listed below.

Letter from Kenny Pirkle (NDOW) to Amanda DeForest (BLM). *Re: September 2014 Oil and Gas Lease Sale in Buena Vista Valley*. February 27, 2014.

6.3 Public Outreach/Involvement

This EA will be made available for a 20-day public comment period through ePlanning.

7.0 LIST OF PREPARERS

The following individuals were involved in the writing, editing, and review of this EA.

7.1 BLM

Name	Resource/Position
Mark Hall	Planning and Environmental Coordinator, Native American Religious Concerns, and Cultural Resources
Doug Rowles	Project Lead, Geology, and Hydrology
David Davis	Nevada State Office Geologist
Eric Baxter	Invasive, Non-Native Species
Robert Burton	Air, Soil, and Vegetation
Fred Holzel	Hazardous Materials
Wes Barry	Range Resources
Amanda DeForest	Threatened and Endangered Species, Wildlife, Migratory Birds, and Special Status Species
John McCann	Wetland/Riparian Zones, and Water Resources
Debbie Dunham	Lands and Realty
Samantha Gooch	Wild Horse and Burros
Robert Bunkall	Geographic Information Systems

8.0 REFERENCES

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BLM. EA/FONSI/DR *Winnemucca Field Office Oil and Gas Leasing Environmental Assessment* NV-020-05-EA-21. Dated October 21, 2005.

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FIGURES

APPENDIX A
Nominated Parcels and Legal Descriptions